

**Contact**  
New York  
Jian Hu  
Richard Cantor

**Phone**  
1.212 553 1653

## Structured Finance Rating Transitions: 1983-2002

### *Comparisons with Corporate Ratings and Across Sectors*

#### Summary

- Structured finance ratings have changed much less frequently than have corporate ratings, to date. As a result, structured ratings have been less volatile than corporate ratings overall, even though the average number of notches changed per rating action has historically been higher in structured finance than in corporate finance.
- Average annual and multi-year migration rates from higher rating categories to ratings of Caa or below (i.e. those with the highest loss expectations) are similar in the structured finance and corporate sectors.
- Average annual upgrade rates and downgrade rates have been roughly equal for structured finance securities, in contrast to the corporate sector where average annual downgrade rates have historically exceeded upgrade rates.
- Structured finance ratings, like corporate ratings, experience strong positive path dependency, or rating change momentum. Securities undergoing rating changes in one year are much more likely to sustain further changes in the same direction in the following year, in comparison to securities that experience no rating change or a change in the opposite direction.
- Not surprisingly, rating changes across tranches of the same deal are strongly interdependent. When one tranche undergoes a rating change, about 70 percent of all other tranches within the same deal undergo a rating change in the same direction in the same year and virtually none experiences a rating change in the opposite direction.
- Across structured finance sectors, average rating volatility is very similar. However, some sectors such as CMBS and RMBS have had higher average upgrade rates and lower average downgrade rates than other sectors; while sectors such as CDOs and ABS have had higher downgrade rates and lower upgrade rates.
- The CDO sector in 2002 experienced an extremely high downgrade rate and a very low upgrade rate, driven primarily by an extraordinarily high rate of downgrades and defaults in corporate bonds that formed the underlying pools in collateralized bond obligations (CBOs).
- Although the international structured finance sector is relatively small with most of its growth occurring in recent years, the available data to date indicates that ratings in this sector are also highly stable and show similar rating transition properties to those observed in the U.S. structured finance market
- Many factors may contribute to the observed differences between structured finance and corporate rating transition experiences. Some of these factors include differences in the (1) sectoral rating distributions, (2) macroeconomic drivers of risk in the corporate sector and in the consumer and mortgage finance sectors, (3) the nature of pooled and idiosyncratic risks and (4) the concentration risk associated with some originators and servicers.

*Table of Contents*

Introduction .....3

Study Methodology and Data Pool .....3

Annual Rating Transitions in Structured Finance .....5

Multiple-Year Rating Transitions in Structured Finance .....6

Age Profiles of Structured Finance Rating Transitions.....8

Rating Drift, Volatility and Notches Per Rating Move in Structured Finance.....9

Structured Finance Rating Change Momentum .....11

Rating Change Dependency Across Tranches in the Same Deal .....12

Rating Transitions Across Structured Finance Sectors .....13

International Structured Finance Rating Transitions.....16

Summary Comparisons and Some Interpretations.....18

Appendix I: Methodology .....19

Appendix II: Transition Matrices.....20

Selected Moody's Special Comments On Structured Finance Rating Transitions .....32

Selected Moody's Special Comments On Corporate Issuer Default And Rating Transitions.....32

## Introduction

---

The structured finance world has experienced explosive growth in recent years. Securitization has expanded into virtually every aspect of the market economy – from traditional residential mortgages and credit card balances to aircraft leases, commercial mortgages, mutual fund fees, emerging market bonds, synthetic arbitrage CDOs, and credit derivatives. Moody's first published rating change statistics in residential mortgage-backed securities (RMBS) and public asset-backed securities (ABS) in 1995. Since 2001, we have added special reports focusing on rating migrations in other large sectors – ABS and collateralized debt obligations (CDO) as well. This Special Comment presents Moody's first comprehensive rating transition study of all structured finance securities worldwide with comparisons to corporate rating transitions as well as comparisons across various structured finance sectors.

Structured finance ratings are often linked, either directly or indirectly, to ratings of industrial corporations, financial institutions, and sovereign entities. Obviously, the ratings of guaranteed or letter-of-credit(LOC)-backed structured securities are directly affected by changes in their credit enhancer's ratings. In addition, corporate rating transitions have a powerful effect on the rating transitions on CDOs, credit derivatives, and other credit-linked notes. Moreover, the financial performance of collateral originators, and servicers also influence the ratings of individual structured securities. It is therefore important to note that the structured ratings migration statistics that are reported in this study could be the results of unexpected changes of collateral performance, changes in corporate or other fundamental credit ratings, or a combination of both. Furthermore, Moody's ratings do not address rating transition risk but look at the expected loss on a given tranche.

For all of the asset classes we study, which includes RMBS, ABS, CDO, CMBS (commercial mortgage-backed securities) and other structured deals such as structured notes and credit derivatives, we find their ratings have been considerably more stable than corporate ratings during the same historical period. Moreover, over a one-year horizon, unlike corporate ratings, for which average downgrade rates generally exceed upgrade rates, the annual average downgrade and upgrade rates have been roughly equal in structured finance. However, the average number of notches per rating move in the structured finance sector is greater than in the corporate finance sector.

We find that structured finance ratings, like corporate ratings, display path dependency or rating change momentum. In other words, ratings that were downgraded (or upgraded) in a year tend to be downgraded (or upgraded) again within the following year. In addition, we find that rating changes in the same deal, not surprisingly, tend to be highly correlated. Also, statistics from different structured finance sectors reveal strong similarity in their average rating volatility, but the upgrade and downgrade rates have been different across these sectors.

This Special Comment is organized as follows. We begin with descriptions of the data sample and the methodology. This is followed by analysis of the aggregate rating transitions in structured finance along with comparison to corporate rating transitions. This includes analysis of annual rating transition matrices, aggregate downgrade and upgrade rates, age profiles of rating transitions based on the broad rating categories, rating drift, rating volatility, and rating transition matrices over multiple-year horizons. We then examine serial and contemporaneous dependency of rating changes in structured finance ratings. Finally, we compare rating transitions across structured finance sectors, study characteristics of rating transitions in international deals, and offer some interpretations of our key findings in the last section. Additional methodological details and rating transition matrices appear in the Appendix.

## Study Methodology and Data Pool

---

The objective of this study is to present a statistical analysis of rating transitions for Moody's structured finance long-term ratings as a whole, with comparisons across sectors. We have adopted six criteria to select rating observations for this study:

1. Our sample covers a 20-year period from 1983 to 2002.
2. We include all structured finance securities that carried a standard Moody's long-term bond rating<sup>1</sup> at some point between the beginning of 1983 until the end of 2002. This allows us to capture structured finance securities in the ABS, CDO, CMBS, RMBS sectors and a separate sector called "OTHERS" which includes credit derivative securities and structured notes. ABCP (Asset-Backed Commercial Paper) programs, which carry short-term rather than long-term ratings, are excluded.
3. All securities wrapped by financial guaranty insurers or guaranteed by federal agencies or government sponsored enterprises (GSEs) are excluded.
4. Tranches whose ratings are effectively single-name pass-throughs of individual corporate or sovereign ratings are excluded.
5. Tranches carrying the same rating from the same deal are collapsed into a single tranche. In this case, the outstanding tranche with the longest maturity is selected.<sup>2</sup>
6. The sample includes both U.S. and international (non-U.S.) transactions.

---

1. Moody's standard bond ratings are Aaa, Aa1, Aa2, Aa3, A1, A2, A3, Baa1, Baa2, Baa3, Ba1, Ba2, Ba3, B1, B2, B3, Caa1, Caa2, Caa3, Ca, C.

2. As a comparison, we note that in corporate rating transition and default studies, only the issuer rating (on the basis of a senior implied rating) is used.

Applying all six criteria, we obtain a total of 79,176 rating-year observations. For example, by the end of 2002, there were 15,721 structured finance ratings in our sample, of which 5,498 are from the ABS sector, 4,576 are from the RMBS sector, 2,569 are from the CMBS sector and 2,448 are from the CDO sector. Note that HEL (Home Equity Loans) and MH (Manufactured Housing) are included in the ABS sector. Explanations for the use of these criteria and the details of our transition study methodology are illustrated in Appendix 1.

Distributions of structured finance ratings by broad ratings and by sectors are displayed in Exhibit 1 and Exhibit 2. For comparison, we also provide the rating distribution for corporate ratings in Exhibit 1.

### Exhibit 1. Distribution of Structured Finance and Corporate Finance Ratings

| Ratings                   | Structured Finance |        |        |        |        | Corporate Finance |        |        |        |        |
|---------------------------|--------------------|--------|--------|--------|--------|-------------------|--------|--------|--------|--------|
|                           | 1/1/85             | 1/1/90 | 1/1/95 | 1/1/00 | 1/1/02 | 1/1/85            | 1/1/90 | 1/1/95 | 1/1/00 | 1/1/02 |
| Aaa                       | 91.7%              | 36.4%  | 41.5%  | 35.4%  | 33.2%  | 3.5%              | 3.7%   | 2.5%   | 1.4%   | 1.5%   |
| Aa                        | 0.0%               | 58.2%  | 28.2%  | 16.9%  | 16.2%  | 17.4%             | 10.0%  | 10.1%  | 8.3%   | 10.3%  |
| A                         | 8.3%               | 1.8%   | 13.7%  | 20.0%  | 20.3%  | 31.2%             | 24.4%  | 27.6%  | 21.9%  | 22.4%  |
| Baa                       | 0.0%               | 2.9%   | 10.9%  | 16.2%  | 17.4%  | 17.1%             | 15.1%  | 18.6%  | 22.1%  | 24.3%  |
| Ba                        | 0.0%               | 0.5%   | 3.7%   | 6.2%   | 7.7%   | 18.0%             | 22.1%  | 17.0%  | 11.9%  | 11.5%  |
| B                         | 0.0%               | 0.0%   | 1.7%   | 3.7%   | 3.7%   | 9.8%              | 19.6%  | 18.8%  | 25.2%  | 19.6%  |
| Caa-C                     | 0.0%               | 0.2%   | 0.3%   | 1.6%   | 1.6%   | 3.0%              | 5.2%   | 5.4%   | 9.3%   | 10.4%  |
| Investment Grade          | 100%               | 99.4%  | 94.3%  | 88.6%  | 87.1%  | 69.2%             | 53.1%  | 58.8%  | 53.7%  | 58.5%  |
| Speculative Grade         | 0.0%               | 0.6%   | 5.7%   | 11.4%  | 12.9%  | 30.8%             | 46.9%  | 41.2%  | 46.3%  | 41.5%  |
| Total ratings outstanding | 12                 | 649    | 3325   | 8201   | 12296  | 1585              | 2119   | 2200   | 3149   | 2950   |

Two attributes stand out in Exhibit 1. First, it shows that the rating distribution in structured finance is quite different from that in corporate finance. In structured finance, ratings are predominantly investment grade while in corporate finance a significant portion consists of speculative-grade issuers. For instance, at the beginning of 2002, 41.5% of outstanding ratings were speculative grade in corporate finance while only 12.9% were speculative grade in structured finance. Furthermore, of the investment grade, the most common rating is Aaa in structured finance, while it is Baa in corporate finance.

Second, there has been phenomenal growth in structured finance. The number of outstanding ratings given by Moody's was less than 1,000 ratings before 1990, but at the end of 2001, the number greatly exceeded 10,000. It should be noted that it is the number of rated corporate issuers that are reported in Exhibit 1 while for structured finance it is the number of securities, except that tranches of a single rating within a transaction are collapsed. But even if we account for this difference, structured finance still has grown significantly faster than corporate finance. This can be seen in Exhibit 2, which compares the distributions of structured finance ratings and structured deals.

As illustrated, the average number of Moody's ratings in a structured deal has increased significantly over time. According to data presented in Exhibit 2, at the beginning of 1995, the average number of ratings per transaction was approximately 1.6 (notice that we have collapsed same-rating tranches in the same deal into a single tranche), but, at the beginning of 2002, it has become 2.4. Meanwhile, the dominance of the share of RMBS deals in the Moody's-rated structured finance universe has declined substantially over time, with ABS (noting that HEL is included in ABS) taking over as the largest sector.

### Exhibit 2. Distribution of Structured Finance Ratings and Deals by Sector

| Ratings                         | Structured Finance Ratings |        |        |        |        | Structured Finance Deals |        |        |        |        |
|---------------------------------|----------------------------|--------|--------|--------|--------|--------------------------|--------|--------|--------|--------|
|                                 | 1/1/85                     | 1/1/90 | 1/1/95 | 1/1/00 | 1/1/02 | 1/1/85                   | 1/1/90 | 1/1/95 | 1/1/00 | 1/1/02 |
| ABS                             | 8.3%                       | 18.6%  | 23.9%  | 36.7%  | 35.6%  | 8.3%                     | 18.3%  | 25.7%  | 38.6%  | 38.8%  |
| CDO                             | 0.0%                       | 0.0%   | 2.0%   | 9.3%   | 14.5%  | 0.0%                     | 0.0%   | 2.5%   | 8.0%   | 12.3%  |
| CMBS                            | 0.0%                       | 1.4%   | 5.1%   | 13.4%  | 16.5%  | 0.0%                     | 1.5%   | 3.0%   | 5.7%   | 6.9%   |
| RMBS                            | 91.7%                      | 79.8%  | 68.1%  | 36.3%  | 29.4%  | 91.7%                    | 80.1%  | 67.5%  | 39.1%  | 33.2%  |
| OTHERS                          | 0.0%                       | 0.2%   | 0.9%   | 4.3%   | 4.0%   | 0.0%                     | 0.2%   | 1.2%   | 8.6%   | 8.8%   |
| Total ratings/deals outstanding | 12                         | 649    | 3325   | 8201   | 12296  | 12                       | 617    | 2072   | 3788   | 5136   |

## Annual Rating Transitions in Structured Finance

Exhibit 3 presents the broad-rating-based annual rating transition matrix. Each cell of the matrix is the weighted average percentage of ratings that existed at the beginning of each year in the sample that ended up in each rating category at the end of that year. For comparison, Exhibit 3 also includes the corporate rating transition matrix, with the default column merged into the “Caa or below” (i.e. the Caa, Ca and C rating categories combined) column.

### Exhibit 3. Moody's All Structured Finance Annual Rating Transition Matrix, 1983-2002 (Adjusted for Withdrawn Ratings)

| Moody's Structured Finance Rating Transitions 1983-2002 |        |        |        |        |        |        |              |
|---|--------|--------|--------|--------|--------|--------|--------------|
|   | TO:    |        |        |        |        |        |              |
| FROM:   | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa   | 98.90% | 0.89%  | 0.13%  | 0.04%  | 0.00%  | 0.00%  | 0.03%        |
| Aa  | 5.45%  | 91.46% | 2.28%  | 0.63%  | 0.09%  | 0.03%  | 0.06%        |
| A   | 1.13%  | 2.74%  | 93.54% | 1.82%  | 0.52%  | 0.07%  | 0.18%        |
| Baa   | 0.53%  | 0.65%  | 2.25%  | 90.40% | 3.83%  | 1.26%  | 1.08%        |
| Ba  | 0.14%  | 0.06%  | 0.78%  | 3.99%  | 86.33% | 3.24%  | 5.46%        |
| B   | 0.00%  | 0.06%  | 0.06%  | 0.46%  | 0.85%  | 88.95% | 9.62%        |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.17%  | 0.34%  | 99.49%       |

| Moody's Corporate Finance Rating Transitions 1983-2002 |        |        |        |        |        |        |              |
|--|--------|--------|--------|--------|--------|--------|--------------|
|  | TO:    |        |        |        |        |        |              |
| FROM:  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa  | 89.83% | 9.17%  | 1.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        |
| Aa   | 0.79%  | 89.66% | 9.04%  | 0.37%  | 0.09%  | 0.02%  | 0.03%        |
| A  | 0.05%  | 2.53%  | 90.68% | 5.77%  | 0.70%  | 0.22%  | 0.04%        |
| Baa  | 0.05%  | 0.28%  | 5.94%  | 86.95% | 5.25%  | 1.12%  | 0.41%        |
| Ba   | 0.01%  | 0.04%  | 0.61%  | 5.50%  | 82.59% | 9.01%  | 2.23%        |
| B  | 0.01%  | 0.06%  | 0.23%  | 0.61%  | 6.19%  | 81.22% | 11.68%       |
| Caa or below   | 0.00%  | 0.00%  | 0.00%  | 1.01%  | 2.57%  | 6.53%  | 89.88%       |

Exhibit 3 shows that Moody's structured finance ratings are very stable. For five of the seven broad rating categories and all investment grade categories,<sup>3</sup> over 90% do not have rating changes in one year, excluding withdrawn ratings. The percentage of unchanged ratings for Aaa is close to 99%. Comparing these percentages with those from corporate finance, we find that structured finance ratings have been more stable. This is particularly true for Aaa-rated securities, which have a frequency of unchanged ratings of 98.90%, as compared with 89.83% for Aaa-rated corporate issuers.

Exhibit 3 also indicates that structured finance securities have not just been less likely to be changed, but they have been particularly less likely to be downgraded than similarly rated corporate securities. A review of the first off-diagonal (or one broad-rating category change) cells reveals that most of the downgrade/upgrade ratios in structured ratings are much lower than those in corporate ratings. This is especially true for Aa, A and Ba ratings. In fact, as shown in Exhibit 4, the aggregate average downgrade/upgrade ratio based on broad ratings in structured finance is only 1.2, as compared to 2.3 in corporate finance. Exhibit 4 also breaks out the downgrade/upgrade ratios for 2002 only. In 2002 alone, structured finance ratings were downgraded much more often than upgraded and were very similar in this regard to corporate ratings in terms of their broad-rating-based downgrade/upgrade ratios.

3. The seven broad rating categories are Aaa, Aa (including Aa1, Aa2, Aa3), A (including A1, A2, A3), Baa (including Baa1, Baa2, Baa3), Ba (including Ba1, Ba2, Ba3), B (including B1, B2, B3), Caa or below (including Caa1, Caa2, Caa3, Ca, C). For corporate ratings, Caa or below also includes defaults.

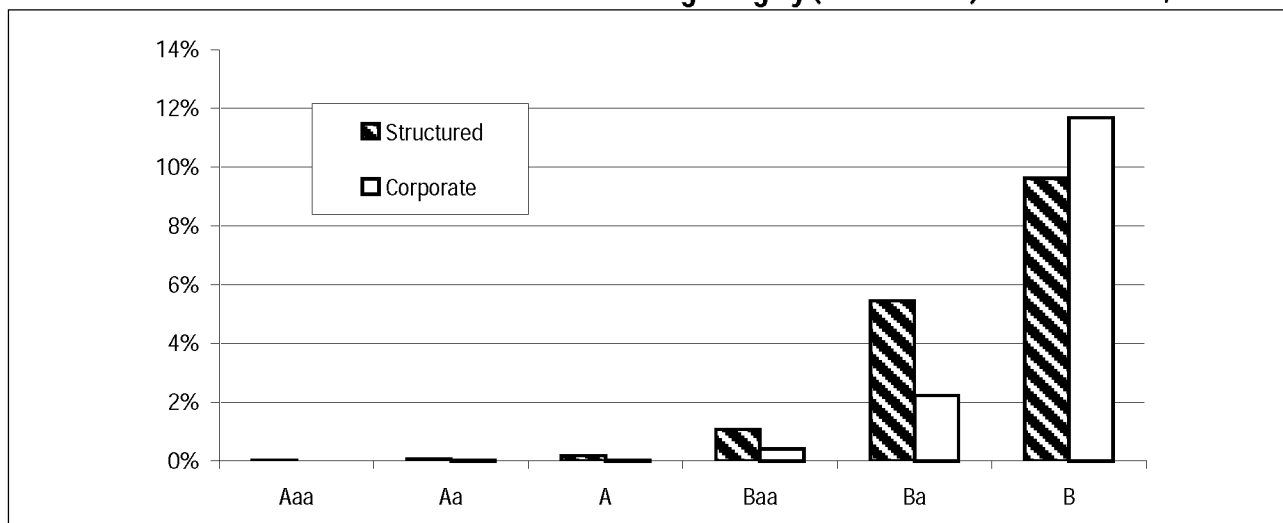
**Exhibit 4. Comparison of Aggregate Average Downgrade and Upgrade Rates between Structured Finance and Corporate Finance, 1983-2002**  
*(Broad-Rating-Based, Adjusted for Withdrawn Ratings)*

|                               | Downgrade Rate | Upgrade Rate | Unchanged Rate | Downgrade/Upgrade ratio |
|-------------------------------|----------------|--------------|----------------|-------------------------|
| Structured Finance, 1983-2002 | 3.21%          | 2.70%        | 94.09%         | 1.2                     |
| Corporate Finance, 1983-2002  | 9.42%          | 4.14%        | 86.44%         | 2.3                     |
| Structured Finance, 2002 only | 6.46%          | 1.41%        | 92.13%         | 4.6                     |
| Corporate Finance, 2002 only  | 14.42%         | 2.61%        | 82.97%         | 5.5                     |

Exhibit 3 also indicates that structured finance ratings powerfully discriminate against the risk of transition to sharply higher expected loss rates over one-year horizons. The “Caa or below” column in Exhibit 3 shows that lower rated securities have higher percentages moving into this column – the lowest rating category with the highest expected loss in this study. In addition, the percentages in this column are very similar between structured finance and corporate finance. This implies that as opinions of future relative creditworthiness, Moody’s structured finance ratings possess discriminatory power.

Exhibit 5 shows the comparison of transition rates for both structured ratings and corporate ratings to the lowest rating category. Overall the risk of moving from a higher rating category into the Caa or below category within one year is slightly higher in structured finance than in corporate finance. Except for the B rating category, the likelihood of transition into Caa or below of all rating categories are more than twice as high in structured finance as those in corporates.

**Exhibit 5. The Likelihood of Transition into the Lowest Rating Category (Caa or below) Within One Year, 1983-2002**



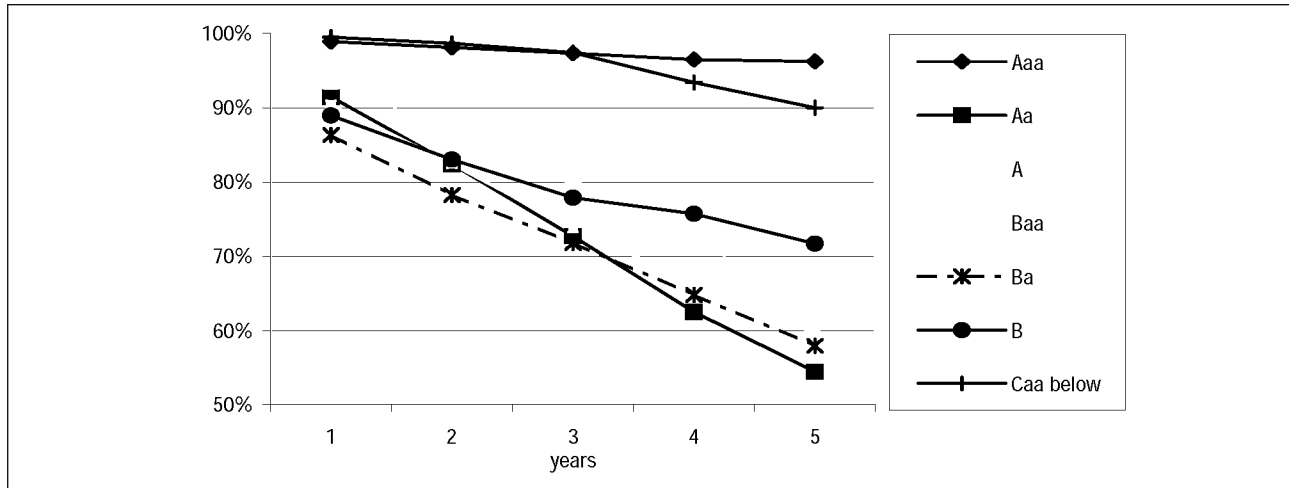
**Multiple-Year Rating Transitions in Structured Finance**

Ratings in structured finance are very stable not only within a one-year horizon but also within horizons of two, three or even more years. Multi-year transition matrices, ranging from two- to five-year horizons, are presented in detail in Exhibits 36 and 37 in the appendix.

A summary measure of stability is exhibited in Exhibit 6, which shows that even after three years, the cumulative percentage of ratings unchanged remains above 70% for all broad rating categories. Aaa ratings are particularly stable, with over 95% of structured securities maintaining their Aaa ratings even over the five-year horizon.

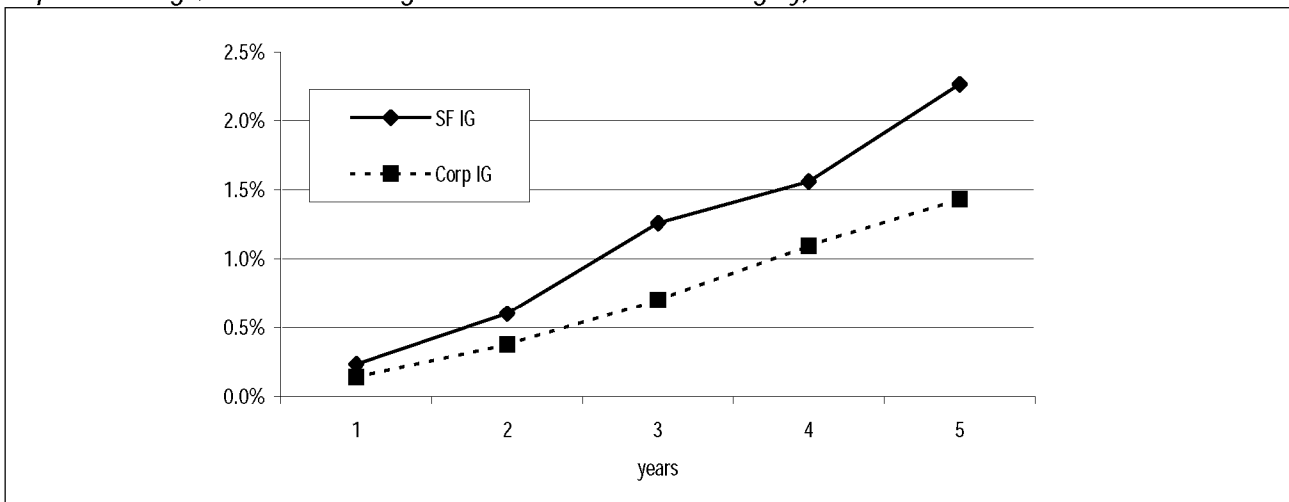
Of course, as the horizon extends, more ratings are withdrawn and fewer ratings are eligible in the calculation of these rating transition percentages in Exhibit 6. In other words, the sample sizes could be different over different time horizons. There are also substantial differences in rating withdrawn frequencies across ratings. On average, structured securities rated Ba or B have had much lower withdrawn frequencies than those rated Aaa or A, reflecting typically shorter average lives for Aaa or A rated securities than Ba and B rated ones. In fact, about half of the Aaa rated securities would be withdrawn in five years.

**Exhibit 6. Cumulative Frequencies of Ratings Remain Unchanged over Multiple-Year Horizons, 1983-2002**  
*(Adjusted for Withdrawn Ratings, Broad Ratings Based)*

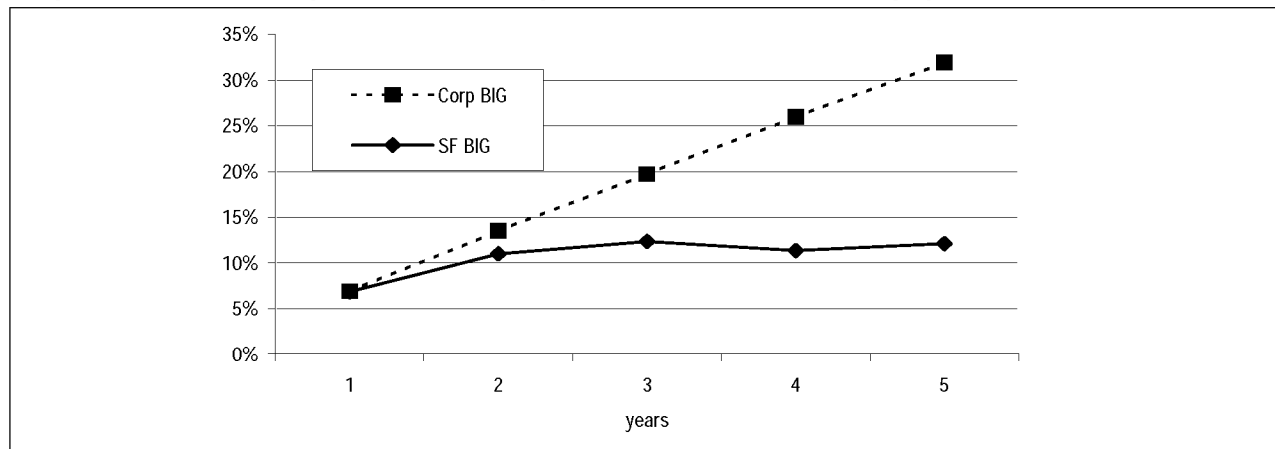


Similar to our analysis on the one-year horizon, we compare in Exhibits 7 and 8 the likelihood of transitioning from higher rating categories into the lowest rating category, as a measure of ratings' discriminating power. The results show over different horizons that the structured finance and corporate sectors are similar even over longer time horizons, with the likelihood of transition to the lowest rating category being much higher for speculative-grade than for investment-grade credits. As shown in Exhibit 8, the risk of corporate securities has generally been higher, as roughly 32% of all speculative-grade corporate securities have transitioned to Caa or lower within five years, whereas the comparable number for structured finance has been only about 12%. The historical long-term transition rates for structured finance may, however, change over time since the growth of the speculative-grade component of structured finance sector has been a fairly recent phenomenon. Moreover, Exhibit 7 indicates, that although the risk of investment-grade structured finance credits transitioning into the lowest rating category has been very low, it has been higher than seen for comparably rated corporate securities. However, it is worth noting that most of the corporate bonds that transitioned from investment grade into these lower rating categories subsequently defaulted and suffer fairly high loss severity. In contrast, most of the investment-grade structured finance transitions have been to the Caa category, rather than the Ca or C category, implying that Moody's does not expect loss rates on these structured securities to be as large as those typically observed on defaulted corporate securities.

**Exhibit 7. Cumulative Frequencies of Transition into the Lowest Rating Category (Caa or below) from Investment Grade (IG) Rating Categories 1983-2002**  
*(Broad-rating based, Adjusted for withdrawn ratings; For corporate ratings, defaults are merged into the Caa or below category)*



**Exhibit 8. Cumulative Frequencies of Transition into the Lowest Rating Category (Caa or below) from Below Investment Grade (BIG) Rating Categories 1983-2002** (*Broad-rating based, Adjusted for withdrawn ratings; For corporate ratings, defaults are merged into the Caa or below category*)



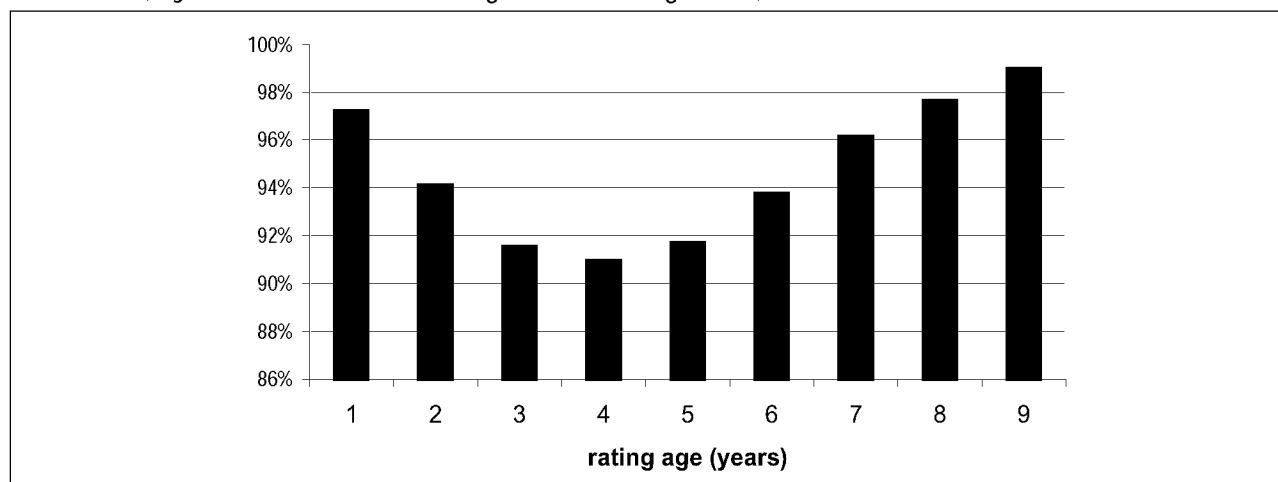
### Age Profiles of Structured Finance Rating Transitions

The majority of structured deals have a fixed pool of (perhaps amortizing) assets. As newly originated transactions age, detailed performance information on the underlying asset pools become available. This data, which is factored into the models used to help evaluate the expected loss in these transactions, may change the original assessment of credit risk on some tranches, causing ratings to change. After a certain point in the life of a deal, as collateral performance becomes more stable, senior bonds are paid off, and deals become de-levered, ratings would then also be stabilized, or in some cases rise. In this section we investigate whether there is such an age pattern or “seasoning effect” in rating changes.

Because almost all structured finance ratings are first assigned at the time of the transaction origination, the age of a rating is a reasonable proxy for the age of a transaction. The rating age is defined as the number of years from the starting year of a rating to the cohort year. The starting year is the following year after a rating is officially assigned. For instance, if a rating is assigned in April 1997, the starting year is 1998. If the cohort year is 2001, then the age of the rating is three. The rating age is only measured by years.

Using this definition, we sort all structured securities into each rating-age vintage. For instance, all one-year old securities are in the one-year vintage, and all two-year old securities are in the two-year vintage. These rating-age vintages are different from rating-year cohorts in the sense that a rating-year cohort consists of all securities at the beginning of a year regardless of its rating age. For each rating-age vintage, the weighted average annual downgrade, upgrade, and unchanged frequencies (adjusted for withdrawn ratings, weighted by sizes of each rating-age vintage) are computed. The frequencies of rating unchanged over a year are shown in the vertical axis of Exhibit 9. Exhibit 10 shows the frequencies of annual upgrades and downgrades.

**Exhibit 9. Annual Frequencies of Rating Unchanged Conditional on Rating Age in Structured Finance, 1990-2002** (*Adjusted for Withdrawn Ratings, Broad-Rating Based*)





**Exhibit 10. Annual Downgrade and Upgrade Frequencies Conditional on Rating Age in Structured Finance, 1990-2002 (Adjusted for Withdrawn Ratings, Broad-Rating Based)**

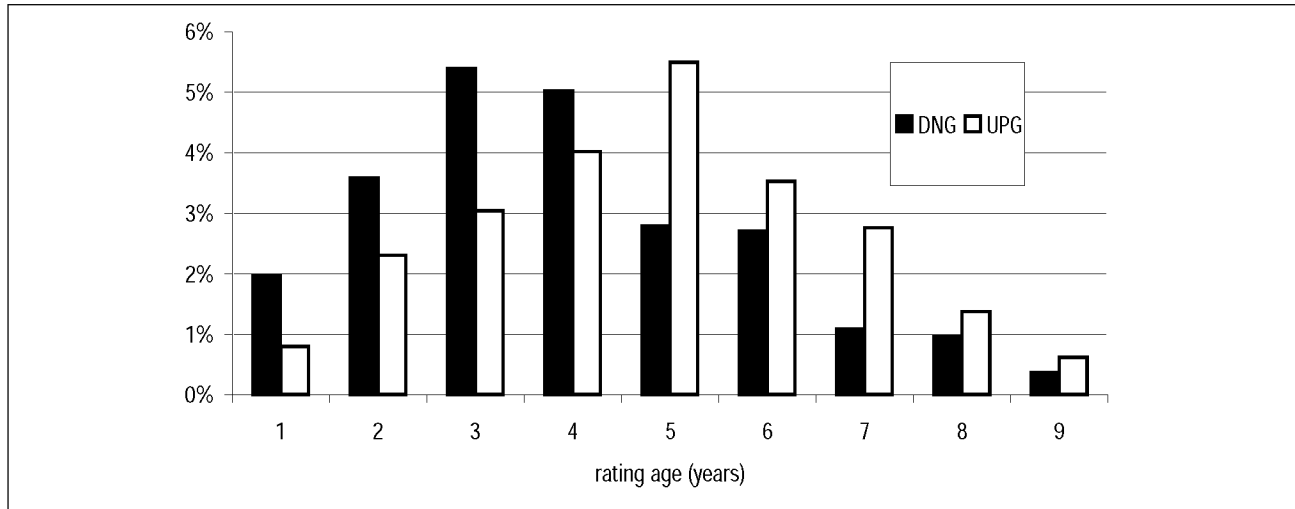


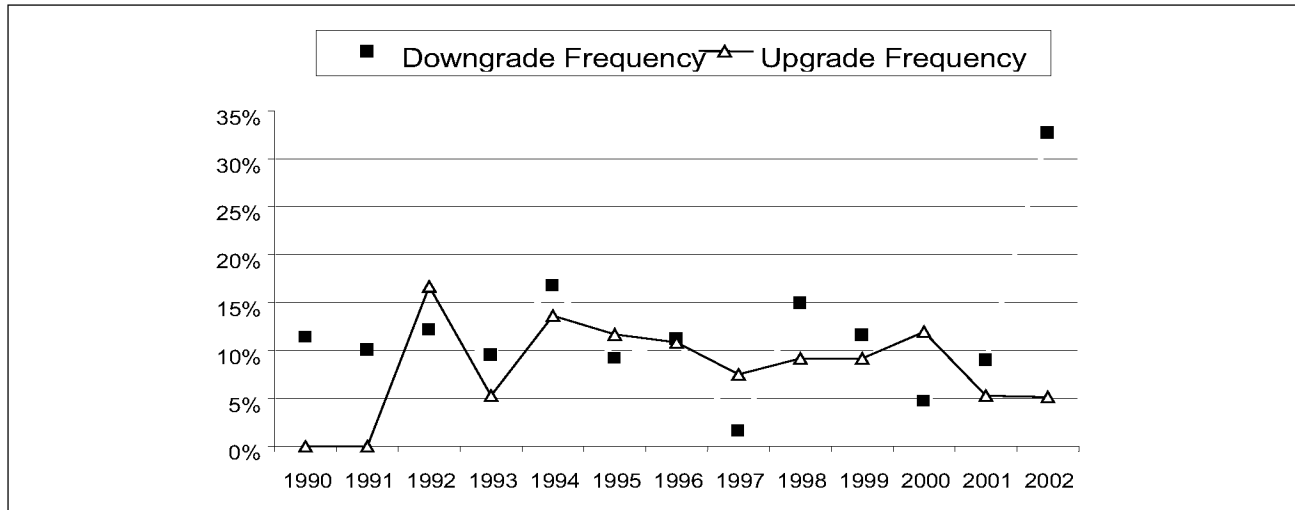
Exhibit 9 indicates that, after a rating is assigned, ratings become increasingly vulnerable to change and this trend bottoms out in the fourth year. After the fifth year, ratings become gradually more stable. More specifically, about 8% of the structured securities have experienced a broad rating change in the fourth or fifth year, and only about 2% have had rating changes in the first year or the eighth year.

Exhibit 10 breaks down changed ratings into downgrades and upgrades, and highlights the hump shapes in average annual rating downgrades and upgrades as a function of rating age. Both the annual upgrade and downgrade frequencies increase in the first years and then decline. On average, the frequency of annual broad rating downgrades peaks in the third year of the life of a rating, and the frequency of upgrade peaks in the fifth year. Exhibit 10 also shows that in the first four years after a rating is assigned, annual downgrade frequencies marginally surpass annual upgrade frequencies but after year five, annual upgrade frequencies are consistently and substantially higher than annual downgrade frequencies. These results imply that rating transition frequencies may also be age-dependent.

**Rating Drift, Volatility and Notches Per Rating Move in Structured Finance**

In this section, we present rating transition statistics measured at the level of refined-rating categories. Exhibit 11 depicts the annual time series of upgrade and downgrade frequencies weighted by the number of notches per rating move. Because there are few observations before 1990, Exhibit 11 begins as of that year.

**Exhibit 11. Weighted Average Upgrade and Downgrade Frequencies (Adjusted for Withdrawn ratings, Refined-Rating-Based, Adjusted for the Number of Notches Per Rating Move)**



The downgrade frequency in Exhibit 11 is computed as the total number of downgraded notches (i.e. the number of downgrades weighted by the size of downgrades) divided by the total number of outstanding ratings at the beginning of the year. In addition, we have adjusted the denominator for withdrawn ratings by subtracting half of the ratings withdrawn for that year – a statistical technique commonly used to correct for data truncation. This technique assumes that ratings are withdrawn regularly throughout the year. The upgrade frequencies are calculated similarly.

Exhibit 11 shows that there is no clear trend in the upgrade and downgrade frequencies. Both appear to fluctuate around a constant mean, except in 2002. For instance, in 1998 and 1999 we observed higher downgrade rates but in 2000 there were higher upgrade rates. Then in 2001, the balance tipped again towards more downgrades with the downgrade rate at 9.02% and the upgrade rate at 5.39%.

The year 2002 marks a significant shift in the downgrade frequency from past experiences in structured finance. The refined-rating based downgrade frequency reached 32.83% while the upgrade frequency was about the same as 2001 at 5.23% (both frequencies are adjusted for withdrawn ratings and notches per rating move).

Downgrade and upgrade frequencies can also be combined into a single metric, “rating drift”, that illustrates the overall trend of rating movement. Rating drift is defined as the difference between the weighted average upgrade frequency and the weighted average downgrade frequency on the basis of refined ratings, weighted by notches per rating change and adjusted for withdrawn ratings. This definition gives the following properties to the drift term. First, if there are no downgrades or upgrades, the rating drift is zero. Second, if the weighted average downgrade frequency equals the weighted average upgrade frequency, the rating drift is also zero. Third, the larger the difference between the upgrade and downgrade frequencies, the larger the upward rating drift.

Rating volatility here is defined as the sum of the number of downgrade rates and upgrade rates. Again these are weighted by the number of notches per rating change, divided by the total outstanding ratings at the beginning of the year minus half of the withdrawn ratings. Rating volatility has the following properties. First, if there is no rating move, the rating volatility is zero. Second, if the rating downgrade rate equals the upgrade rate (notice that the rating drift is zero in this case), the rating volatility will be strictly positive. The combination of rating drift and rating volatility provides a good picture of rating dynamics. Exhibit 12 displays the time series of rating drift and rating volatility for structured securities.

### Exhibit 12. Rating Drift and Volatility in Structured Finance

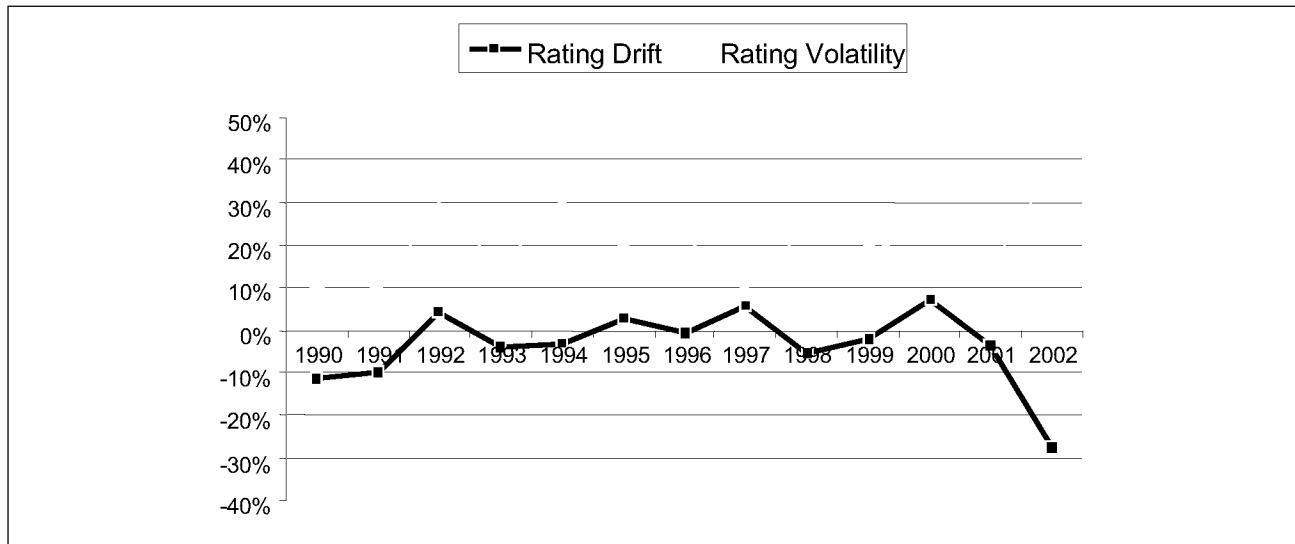
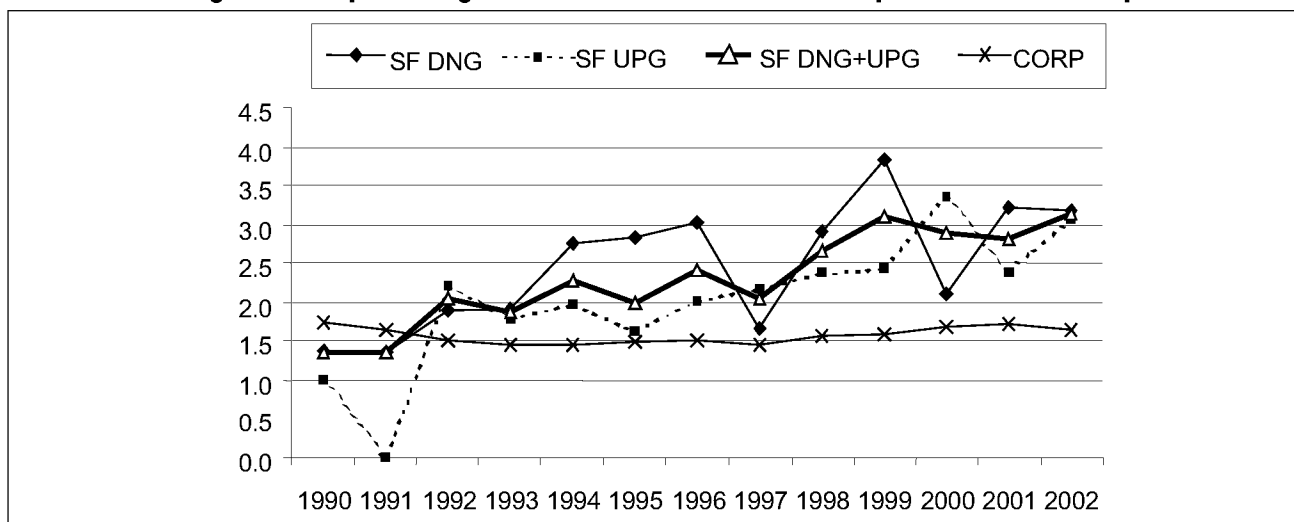


Exhibit 12 shows that the rating drift was randomly distributed around zero between 1992 and 2001. As we commented earlier, 2002 is an extremely volatile year with very steep downward drift and high rating volatility. The weighted average rating drift over time (i.e. further weighted by the number of outstanding ratings each year) before 2002 is miniscule, -0.39%, and the rating volatility is 18.55%. However, using a period from 1990 to 2002, the weighted average rating drift becomes -5.69%, and the weighted average rating volatility reaches 22.35%.

We report the weighted average rating migration frequencies primarily so that we classify rating moves into different types. For example, ratings may move in small steps (one or two notches) but move frequently, or they might not move frequently but might move multiple notches at once. A simple metric that would capture this subtle difference is a measure of the number of notches per rating move. Exhibit 13 provides the time series values of this metric for overall rating moves (downgrade and upgrades combined) between 1990 and 2002, as well as for downgrades and upgrades separately. For comparison, we have also included the notches per rating move in corporate ratings.

### Exhibit 13. Average Notches per Rating Move in Structured Finance, Compared to those in Corporate Finance



Note: DNG stands for "downgrade rating moves", UPG stands for "upgrade rating moves", and DNG+UPG stands for "downgrade and upgrade rating moves combined" and CORP stand for "all rating moves in the corporate sector".

Exhibit 13 data reveal that the average size of a rating move in structured finance has increased slightly over time. Before 1997, even though there were periods of big rating moves, on average the number of notches per rating move is below two. Since 1998, it has consistently stayed above 2.6. Exhibit 13 also shows that the average number of notches per downgrade generally exceeds that per upgrade (1997 and 2000 are exceptions). As a comparison, notches per rating action in the corporate sector appears to be very stable (approximately 1.6) over the entire sample period, and actually tapered off a little bit in 2002.

### Structured Finance Rating Change Momentum

An examination of momentum, or path dependency, in rating changes is critically important to interpreting the relative riskiness of different securities that carry the same rating. If rating changes are path dependent, they may be predictable to some degree, recently upgraded securities carry less transition risk than recently downgraded securities and one-year transition matrices should not be used to extrapolate multi-year transitions.<sup>4</sup>

To examine structured finance rating change momentum, we follow the method illustrated in Moody's Special Comment, "Understanding Moody's Corporate Bond Ratings and Rating Process," which was published in May 2002. For each rating year, we construct not one, but three rating cohorts, one consisting of securities that were downgraded in the previous year, one consisting of securities that were upgraded in the previous year and one consisting of securities that had no rating change in the previous year. These three cohorts enable us to calculate conditional rating transition matrices. Exhibit 14 provides a summary of the conditional downgrade and upgrade rates in structured finance and corporate ratings.

### Exhibit 14. Rating Change Momentum, 1983-2002

(Adjusted for Withdrawn ratings, Refined-Rating Based, Unadjusted for the Number of Notches Per Rating Move)

| Structured Finance Ratings | Downgraded in t | Upgraded in t | Unchanged in t |
|----------------------------|-----------------|---------------|----------------|
| Downgraded in t-1          | 36.36%          | 3.55%         | 60.10%         |
| Upgraded in t-1            | 3.39%           | 9.97%         | 86.65%         |
| No change in t-1           | 3.52%           | 4.32%         | 92.16%         |
| Unconditional              | 4.15%           | 3.71%         | 92.14%         |
| Corporate Finance Ratings  | Downgraded in t | Upgraded in t | Unchanged in t |
| Downgraded in t-1          | 25.78%          | 7.11%         | 67.11%         |
| Upgraded in t-1            | 6.68%           | 16.15%        | 77.17%         |
| No change in t-1           | 14.01%          | 8.53%         | 77.46%         |
| Unconditional              | 14.70%          | 8.84%         | 76.46%         |

Note: t is the current year and t-1 is the previous year, and downgrades include transitions into default.

4. Without path dependency, this would be feasible. In general, if rating transition follows a Markov process, there should be only one-period memory and no serial correlation. This is because in a Markov process, the next period's distribution is only dependent on the present state and not on any developments in the past. In this paper, multi-period memory, serial correlation, path dependency and rating change momentum are used interchangeably.

As highlighted in Exhibit 14, there is strong positive path dependency in structured finance ratings. For instance, 36.36% of the securities that were downgraded in a year were also downgraded in the following year. This number is much higher than 3.39%, the downgrade frequency conditional on an upgrade. Similarly, the conditional upgrade frequency is 9.97%, much higher than 3.55%, the upgrade frequency conditional on a downgrade.

Exhibit 14 also includes a comparison to the conditional downgrade and upgrade frequencies in the corporate sector over the same time period. Structured finance downgrade momentum appears to have been stronger than the momentum in corporate ratings, and yet, compared again to corporates, structured finance upgrade momentum appears to have been weaker. However, corporate ratings are generally more volatile. In terms of conditional downgrade-to-upgrade or upgrade-to-downgrade ratios, structured finance ratings appear to have stronger upgrade and downgrade momentum than do corporate ratings. Exhibit 14 shows that when conditioned on downgrade, the downgrade-to-upgrade ratio in structured finance is 10.24, but is about 3.6 for the corporate sector. (We treat default as a downgrade in this particular measure.) Similarly, the conditional upgrade-to-downgrade ratio, conditioned on an upgrade, is 2.94 in structured finance, but only 2.42 in corporate finance.

Rating change momentum is shown further in detail through conditional rating transition matrices in Exhibit 15. Here we can see that, if a security with a B rating had been downgraded in the previous year, it would have a particularly high chance (55.94%) of being downgraded one bucket further into the Caa or below category. Similarly, if a Baa rating was downgraded in the previous year, its chance of being downgraded one bucket further to the Ba category is 22.22%. Also, Ba and B have particularly high upgrade momentum.

It should be noted that the upgrade rate from Ba to Baa conditional on a downgrade is also very high at 15.96%, and the downgrade rate from Baa to Ba conditional on an upgrade is also high at 26.26%. The rating reversals observed here in the Baa and Ba rating categories are driven mainly by the GreenTree/Conseco rating changes. In November 1998, its long-term senior debt ratings had been lowered to Ba1 from Baa3, and then in December 1999 its rating was upgraded from Ba1 to Baa3, and then again in April 2000, its rating was downgraded again back to Ba1. There are more than 50 structured securities guaranteed by GreenTree/Conseco that were affected by these rating reversals across three calendar years. Because these securities are not treated as single rating pass-throughs, they were included in this study.

### Exhibit 15. Conditional Annual Rating Transition Matrices in Structured Finance, 1983-2002

| Structured Finance Annual Rating Transition Matrix, Conditional on previously downgraded |       |        |        |        |        |        |              |
|--|-------|--------|--------|--------|--------|--------|--------------|
|  | Aaa   | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa  | 0.00% | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        |
| Aa   | 0.36% | 83.27% | 10.32% | 5.34%  | 0.71%  | 0.00%  | 0.00%        |
| A  | 0.30% | 0.30%  | 80.91% | 13.33% | 3.03%  | 0.00%  | 2.12%        |
| Baa  | 0.48% | 0.00%  | 0.48%  | 62.32% | 22.22% | 5.80%  | 8.70%        |
| Ba   | 0.00% | 0.00%  | 0.00%  | 15.96% | 52.84% | 13.83% | 17.38%       |
| B  | 0.00% | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 44.06% | 55.94%       |
| Caa or below   | 0.00% | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 100.00%      |

| Structured Finance Annual Rating Transition Matrix, Conditional on previously upgraded |         |        |        |        |        |        |              |
|--|---------|--------|--------|--------|--------|--------|--------------|
|  | Aaa     | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa  | 100.00% | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        |
| Aa   | 13.44%  | 86.32% | 0.24%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        |
| A  | 2.14%   | 8.93%  | 88.21% | 0.71%  | 0.00%  | 0.00%  | 0.00%        |
| Baa  | 1.12%   | 5.03%  | 7.82%  | 59.78% | 26.26% | 0.00%  | 0.00%        |
| Ba   | 0.00%   | 0.00%  | 3.03%  | 21.21% | 75.76% | 0.00%  | 0.00%        |
| B  | 0.00%   | 0.00%  | 0.00%  | 0.00%  | 22.22% | 77.78% | 0.00%        |
| Caa or below   | 0.00%   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        |

### Rating Change Dependency Across Tranches in the Same Deal

In this section we discuss the contemporaneous dependency of rating changes across tranches of individual structured transactions. Rating changes in a deal are likely correlated since the same collateral pool backs different tranches. To estimate this correlation, we form a downgrade cohort each year in the following way. We first check each structured

security, let's say, tranche X, to see if the deal, to which tranche X belongs, also contains another tranche, let's say, tranche Y, that has been downgraded. In other words, X and Y belong to the same deal and Y is downgraded in that year. In this case, X is in the downgrade cohort in that same year. If there is no such downgraded Y in the same deal with X, X is not included in the downgrade cohort. Notice if both X and Y experience downgrades in the same year, both of them belong to the downgrade cohort. We use the same method to form upgrade cohorts and unchanged rating cohorts. Based on these cohorts, we compute their rating transition percentages. Exhibit 16 reports the aggregate downgrade and upgrade frequency conditional on whether or not a different tranche in the same deal experienced a downgrade, upgrade or no change within the same year.

**Exhibit 16. Contemporaneous Rating Change Dependency across Tranches in the Same Deal, 1983-2002**  
(Adjusted for Withdrawn Ratings, Refined-Rating Based, Unadjusted for the Number of Notches Per Rating Move)

|  | Downgraded | Upgraded | Unchanged |
|--|------------|----------|-----------|
| Conditional on Another Tranche Being Downgraded            | 70.53%     | 0.60%    | 28.87%    |
| Conditional on Another Tranche Being Upgraded              | 0.57%      | 66.62%   | 32.81%    |
| Conditional on Another Tranche Sustaining No Rating Change | 1.69%      | 2.29%    | 96.02%    |
| Unconditional  | 4.15%      | 3.71%    | 92.14%    |

Exhibit 16 shows that contemporaneous rating change dependency is strongly positive. Specifically, given that a different tranche in the same deal is experiencing a rating downgrade, the percentage of tranches experiencing downgrades is 70.53%, compared with 0.57% if a different tranche in the same deal is experiencing an upgrade, or 1.69% if a different tranche has no rating change. Similarly, given that a different tranche in the same deal is experiencing an upgrade, the percentage of tranches experiencing upgrades is 66.62%, compared with 0.60% if a different tranche in the same deal is experiencing a downgrade, or 2.29% if another tranche has no rating change.

To examine more details of rating change dependency within deals, we also computed conditional rating transition matrices. These transition matrices are in Exhibit 38 in the appendix (also noting that they are broad rating based). Two observations are worth noting. One is that conditional on a another tranche in the same deal experiencing a downgrade, the B-rated tranches have the highest percentage of downgrades (above 84.5%) after being adjusted for withdrawn rating. The remaining 15.5% of the B-ratings stay the same, although there may be rating changes on a refined basis. The Baa-rated tranches have had the second highest percentage of downgrades (about 75%).

Two, conditional on a another tranche experiencing an upgrade, the Ba-rated tranches have the highest upgrade percentage of upgrades (about 69%) after being adjusted for withdrawn ratings, and the Aa-rated tranches have had the second highest percentage (about 66%). Notice that these percentages are from the broad-rating based conditional transition matrices. Similar percentages by ratings on a refined rating basis will even be higher.

**Rating Transitions Across Structured Finance Sectors**

We now analyze rating transitions in the range of structured finance sectors, with the exclusion of ABCP. As mentioned earlier, we have grouped all structured securities into five main sectors: ABS, CDO, CMBS, RMBS, OTHERS. Exhibit 17 briefly summarizes the weighted average annual rating downgrade, upgrade and unchanged frequencies in these five sectors. For comparison, the same frequencies in corporate ratings are also listed.

**Exhibit 17. Annual Downgrade, Upgrade and Rating Unchanged Frequencies in the Structured Finance Sectors** (Broad-Rating Based)

|                           | Downgrade Rate | Upgrade Rate | Unchanged Rate | Withdrawn Rate | Downgrade/Upgrade Ratio |
|---------------------------|----------------|--------------|----------------|----------------|-------------------------|
| ABS, 1991-2002            | 2.95%          | 1.27%        | 86.59%         | 9.19%          | 2.3                     |
| CDO, 1991-2002            | 10.88%         | 0.57%        | 83.35%         | 5.20%          | 19.0                    |
| CMBS, 1991-2002           | 1.57%          | 3.49%        | 88.72%         | 6.22%          | 0.4                     |
| RMBS, 1991-2002           | 1.88%          | 3.61%        | 89.18%         | 5.34%          | 0.5                     |
| OTHERS, 1991-2002         | 4.20%          | 2.78%        | 79.84%         | 13.18%         | 1.5                     |
| All structured, 1983-2002 | 2.99%          | 2.52%        | 87.66%         | 6.84%          | 1.2                     |
| All corporates, 1983-2002 | 8.88%          | 3.90%        | 81.49%         | 5.73%          | 2.3                     |

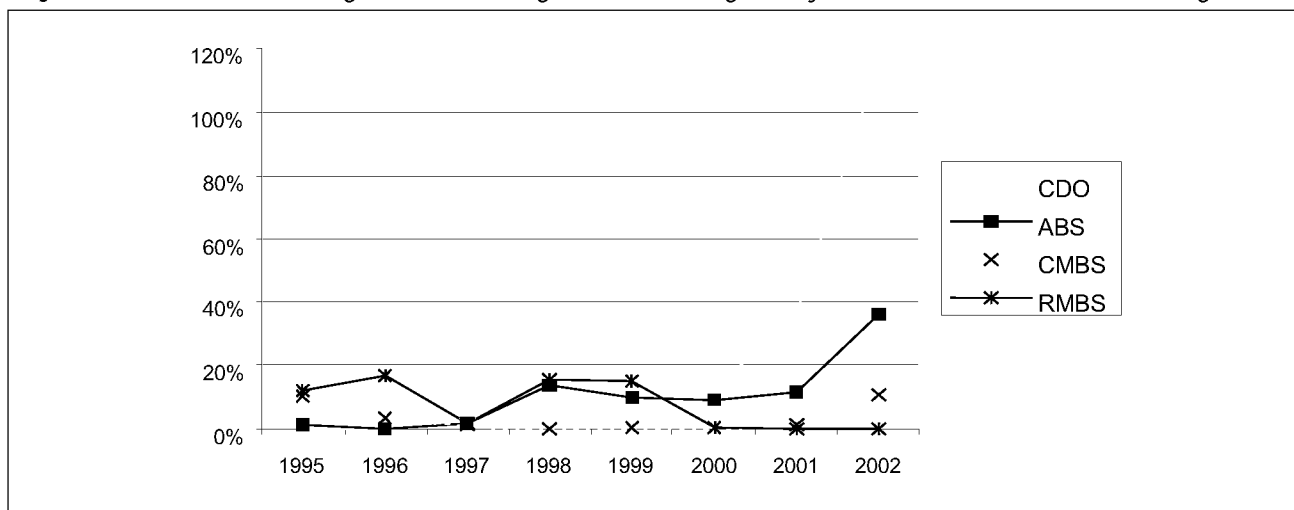
There are several interesting observations to be made about Exhibit 17. First, rating stability is similar across different structured finance sectors with the exception of CDOs. The unchanged rating percentages for the four main sectors are above 80% on average (not adjusted for withdrawn ratings).

Second, there are some significant differences in the downgrade and upgrade frequencies across sectors. CMBS and RMBS have higher upgrade frequencies than downgrade frequencies while the CDO sector has experienced an extremely high downgrade frequency. Higher upgrade frequencies in the general mortgage-collateral (CMBS/RMBS) sectors can be explained by the seasoning of transactions (i.e. loans in the collateral are more seasoned<sup>5</sup>), and the strength of the residential and commercial real estate markets over the last decade.<sup>6</sup> The extremely high downgrade frequency in the CDO sector mirrors similar observations in the corporate sector. For detailed explanations of the CDO sector rating performance, please refer to Moody's CDO publications (e.g. "U.S. High Yield CBOs: Analyzing the Performance of A Beleaguered CDO Category", Moody's Special Comment, January 2003).

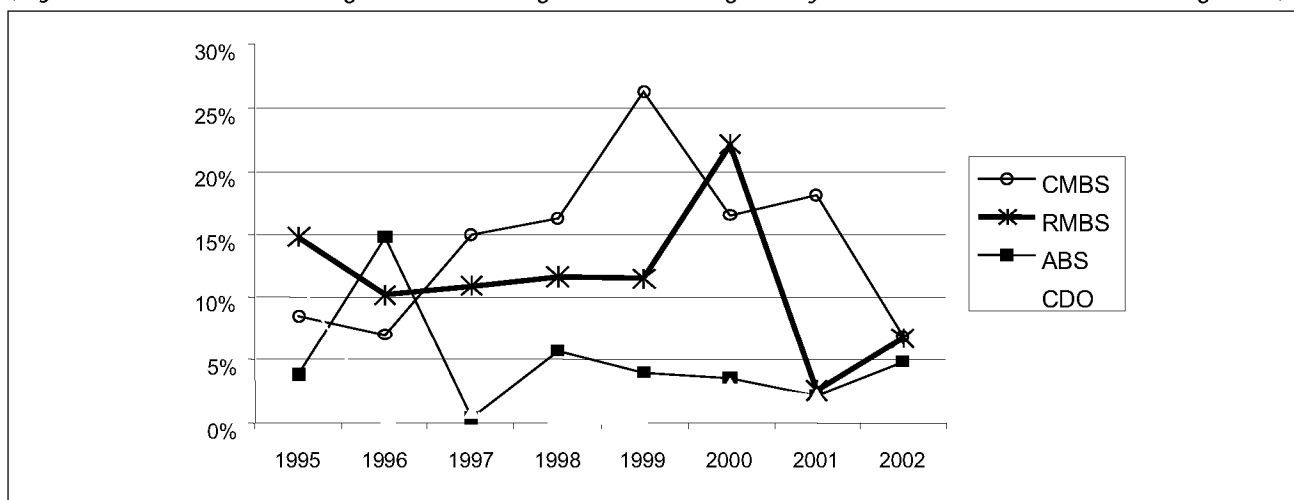
Third, ABS has a relatively high average frequency of withdrawn ratings. This reflects the much shorter average lives of many ABS securities.

Exhibit 17 shows the frequencies of downgrades and upgrades based only on broad-rating categories. Similar to our analysis earlier in this report, analysis of the downgrade and upgrade frequencies of refined ratings can provide us with a more detailed picture of rating changes. These statistics and their time series are in Exhibits 18 and 19.

**Exhibit 18. Weighted Average Downgrade Frequencies in the Structured Finance Sectors, 1995-2002**  
(Adjusted for Withdrawn Ratings, Refined-Rating Based and Weighted by the Number of Notches Per Rating Move)



**Exhibit 19. Weighted Average Upgrade Frequencies in the Structured Finance Sectors, 1995-2002**  
(Adjusted for Withdrawn Ratings, Refined-Rating Based and Weighted by the Number of Notches Per Rating Move)



The sector-specific differences of downgrade and upgrade frequencies evident in Exhibits 18 and 19 reaffirm the results shown in Exhibit 17. Specifically, the CDO and ABS sectors have had higher downgrade frequencies especially

5. Performance statistics from a wide range of mortgage loans have generally shown the hump-shaped age pattern of default rates. In fact, the Bond Market Association (BMA)'s Standard Default Assumption (SDA) employs such a default rate curve as a function of the loan age. In other words, loan performance is strongly tied to seasoning.

6. Although some parts of the commercial real estate market did experience some significant stresses in 2001 and 2002.

in the recent three years than other sectors have had, while the CMBS and RMBS sectors have historically had higher upgrade frequencies than other sectors have had.

Exhibit 20 provides annual, broad-rating transition matrices for each of the four major sectors (we leave the transition matrix for the “OTHERS” sector in the appendix). Exhibit 20 reveals several interesting findings.

First, the stability of speculative grade ratings is markedly different across sectors. Speculative grade securities in the CMBS and RMBS sectors are much more stable than those in the ABS and CDO sectors.

Second, the rating stability of investment-grade securities has been very similar across three of the four main sectors (CDO is the only exception although its Aaa rating is fairly comparable to Aaa ratings in the other three sectors). Rating unchanged frequencies for Aaa rating are above 95% in all four sectors, and for Aa, A and Baa ratings they are almost always above 90% (those in the CDO sector are exceptions).

Third, in the ABS and CDO sectors, the B-rated securities underwent a very high rate of migration into the Caa or below category (more than 20% in the ABS sector, and more than 30% in the CDO sector). In contrast, in the CMBS sector, the rate of such migration was only about 2%. For the Ba-rated securities in the ABS sector, their rating volatility has been particularly high.

Fourth, few securities have ever been upgraded out of the Caa or below category. In both the ABS and CDO sectors, there is actually no such transition. On the other hand, it is also very rare for investment grade securities to migrate within one year into the Caa or below category. As a comparison, in the corporate sector, on average more than 10% of the Caa or below rated issuers got upgraded.

Transition matrices based on the refined ratings and unadjusted for withdrawn ratings are provided from Exhibits 30 to 34 in the appendix.

#### **Exhibit 20. Weighted Average Annual Transition Matrices in the Structured Finance Sectors, 1991-2002**

| ABS       |        |        |        |        |        |        |           |
|-----------|--------|--------|--------|--------|--------|--------|-----------|
|           | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa below |
| Aaa       | 99.05% | 0.82%  | 0.04%  | 0.01%  | 0.00%  | 0.00%  | 0.08%     |
| Aa        | 2.57%  | 94.62% | 1.82%  | 0.67%  | 0.08%  | 0.00%  | 0.24%     |
| A         | 0.63%  | 1.07%  | 96.34% | 1.15%  | 0.63%  | 0.08%  | 0.10%     |
| Baa       | 0.59%  | 0.46%  | 0.97%  | 89.59% | 6.47%  | 1.22%  | 0.71%     |
| Ba        | 0.28%  | 0.14%  | 0.42%  | 7.45%  | 74.40% | 5.63%  | 11.67%    |
| B         | 0.00%  | 0.00%  | 0.00%  | 0.60%  | 0.00%  | 76.65% | 22.75%    |
| Caa below | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 100.00%   |

| CDO       |        |        |        |        |        |        |           |
|-----------|--------|--------|--------|--------|--------|--------|-----------|
|           | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa below |
| Aaa       | 95.37% | 3.09%  | 0.93%  | 0.51%  | 0.10%  | 0.00%  | 0.00%     |
| Aa        | 0.58%  | 89.04% | 5.48%  | 3.50%  | 1.05%  | 0.23%  | 0.12%     |
| A         | 0.16%  | 0.98%  | 89.59% | 6.02%  | 1.95%  | 0.33%  | 0.98%     |
| Baa       | 0.00%  | 0.09%  | 0.51%  | 86.19% | 6.17%  | 3.69%  | 3.34%     |
| Ba        | 0.00%  | 0.00%  | 0.00%  | 1.37%  | 81.48% | 5.83%  | 11.32%    |
| B         | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 68.98% | 31.02%    |
| Caa below | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 100.00%   |

| CMBS      |        |        |        |        |        |        |           |
|-----------|--------|--------|--------|--------|--------|--------|-----------|
|           | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa below |
| Aaa       | 98.49% | 1.51%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%     |
| Aa        | 5.58%  | 93.35% | 0.63%  | 0.18%  | 0.00%  | 0.18%  | 0.09%     |
| A         | 1.45%  | 3.23%  | 93.87% | 1.45%  | 0.00%  | 0.00%  | 0.00%     |
| Baa       | 0.62%  | 1.24%  | 3.03%  | 93.18% | 1.45%  | 0.28%  | 0.21%     |
| Ba        | 0.00%  | 0.00%  | 0.59%  | 2.52%  | 94.67% | 1.78%  | 0.44%     |
| B         | 0.00%  | 0.00%  | 0.16%  | 0.65%  | 1.79%  | 94.95% | 2.44%     |
| Caa below | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 2.70%  | 97.30%    |

Exhibit 20 continued from last page, RMBS

|           | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa below |
|-----------|--------|--------|--------|--------|--------|--------|-----------|
| Aaa       | 99.34% | 0.49%  | 0.14%  | 0.03%  | 0.00%  | 0.00%  | 0.00%     |
| Aa        | 8.03%  | 89.85% | 1.70%  | 0.43%  | 0.00%  | 0.00%  | 0.00%     |
| A         | 2.07%  | 4.28%  | 91.06% | 2.15%  | 0.21%  | 0.03%  | 0.21%     |
| Baa       | 0.67%  | 0.76%  | 3.37%  | 91.58% | 1.88%  | 0.85%  | 0.88%     |
| Ba        | 0.21%  | 0.07%  | 1.41%  | 4.08%  | 90.01% | 1.76%  | 2.46%     |
| B         | 0.00%  | 0.14%  | 0.00%  | 0.42%  | 0.56%  | 92.31% | 6.57%     |
| Caa below | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.28%  | 0.00%  | 99.72%    |

## International Structured Finance Rating Transitions

Our analysis so far has covered all structured finance transactions rated by Moody's, including all international structured transactions. In this final section, we examine exclusively the rating transitions of international structured finance securities – securities (or assets) that are either denominated in currencies other than the US dollar and/or issued in markets outside the U.S. A distribution of international structured finance ratings is displayed in Exhibit 21, and a distribution of international structured finance deals by sectors is shown in Exhibit 22. Exhibit 23 presents the weighted average annual, broad-rating transition matrix for international securities from 1989 because the earliest year for the international sample was 1989.

### Exhibit 21. The Distribution of Moody's International Structured Finance Ratings

| Ratings                             | International Structured Finance Ratings |        |        |        |
|-------------------------------------|--|--------|--------|--------|
|                                     | 1/1/90                                   | 1/1/95 | 1/1/00 | 1/1/02 |
| Aaa                                 | 60.0%                                    | 54.4%  | 36.8%  | 34.1%  |
| Aa                                  | 40.0%                                    | 23.3%  | 19.0%  | 17.6%  |
| A                                   | 0.0%                                     | 10.0%  | 19.8%  | 19.5%  |
| Baa                                 | 0.0%                                     | 7.8%   | 15.2%  | 18.1%  |
| Ba                                  | 0.0%                                     | 4.4%   | 6.4%   | 7.8%   |
| B                                   | 0.0%                                     | 0.0%   | 2.7%   | 2.0%   |
| Caa or below                        | 0.0%                                     | 0.0%   | 0.2%   | 1.0%   |
| Total number of ratings             | 5  | 90     | 1319   | 2862   |
| % of all structured finance ratings | 0.77%                                    | 2.71%  | 16.08% | 23.28% |

### Exhibit 22. The Number of International Structured Finance Deals Rated by Moody's

| Ratings               | International Structured Finance Deals |        |        |        |
|-----------------------|--|--------|--------|--------|
|                       | 1/1/90                                 | 1/1/95 | 1/1/00 | 1/1/02 |
| ABS                   | 1                                      | 23     | 226    | 406    |
| CDO                   | 0                                      | 1      | 168    | 367    |
| CMBS                  | 0                                      | 0      | 25     | 85     |
| RMBS                  | 3                                      | 39     | 194    | 354    |
| OTHERS                | 0                                      | 8      | 198    | 242    |
| Total number of deals | 4                                      | 71     | 811    | 1454   |

The growth of international structured finance ratings has been very impressive as observed in Exhibit 21. Within just two years – from the beginning of 2000 to the end of 2001, the total number of international structured finance ratings has more than doubled from 1319 to 2862. Among them, Aaa and A are the largest rating categories.

In terms of deals, Exhibit 22 shows that there are 1,454 rated deals at the end of 2001. Of these, 406 (or about 28%) are in the ABS sector, 354 are RMBS deals (about 24%), and 367 (or about 25%) are CDO deals. In addition, there are 85 CMBS deals (about 6%), and 242 OTHERS deals (about 17%). In terms of distribution across regions, the United Kingdom and Japan are the two largest issuers.

Exhibit 23 shows that Moody's international structured finance ratings are very stable. Adjusted for withdrawn ratings, the percentages of ratings that remain unchanged during the course of one year exceed 90% for almost all invest-



ment-grade ratings categories (it is 88.2% for Baa). Moreover, lower ratings in the international structured sector have had higher frequencies migrating into the Caa or below rating category, consistent with our general finding based on the entire global sample.

On the refined rating basis, adjusted for withdrawn ratings but unadjusted for notches per rating change, the weighted average downgrade frequency for international ratings has been 8.26% while the weighted average upgrade frequency has been 2.80%. This contrasts with a downgrade frequency of 4.15% and an upgrade frequency of 3.71% in all structured securities. Higher downgrade frequency observed in the international ratings can partially be explained by rating downgrades in the CDO sector. For a comparison of international rating transitions with rating transitions within the U.S. only, please see Exhibit 24. The two rating transition matrices (Exhibits 23 and 24) are remarkably similar except for the B rating category. Notice that there is a higher percentage of CDOs in the international sector than in the global sample. In addition, transition risk is highly weighted by number of tranches outstanding in 2001 and 2002, years which have been under severe downgrade pressure on CDOs. Also bear in mind that the sample sizes and rating distributions are quite different between the U.S. sector and the international sector.

### Exhibit 23. International Structured Finance Annual Rating Transition Matrix, 1989-2002

|              | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below |
|--------------|--------|--------|--------|--------|--------|--------|--------------|
| Aaa          | 97.43% | 2.18%  | 0.32%  | 0.07%  | 0.00%  | 0.00%  | 0.00%        |
| Aa           | 1.48%  | 92.65% | 4.18%  | 1.28%  | 0.27%  | 0.07%  | 0.07%        |
| A            | 0.55%  | 4.79%  | 90.96% | 2.81%  | 0.68%  | 0.00%  | 0.21%        |
| Baa          | 0.00%  | 0.24%  | 1.71%  | 88.20% | 5.13%  | 2.44%  | 2.28%        |
| Ba           | 0.00%  | 0.00%  | 0.20%  | 2.00%  | 85.60% | 4.40%  | 7.80%        |
| B            | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 77.51% | 22.49%       |
| Caa or below | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 100.00%      |

*Note: The number of observations for B and Caa or below rating categories is very small, as seen in Exhibit 21.*

### Exhibit 24. U.S. Structured Finance Annual Rating Transition Matrix, 1989-2002

|              | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below |
|--------------|--------|--------|--------|--------|--------|--------|--------------|
| Aaa          | 99.12% | 0.70%  | 0.10%  | 0.04%  | 0.01%  | 0.00%  | 0.03%        |
| Aa           | 6.00%  | 91.26% | 2.04%  | 0.55%  | 0.06%  | 0.03%  | 0.06%        |
| A            | 1.23%  | 2.41%  | 93.96% | 1.65%  | 0.49%  | 0.08%  | 0.18%        |
| Baa          | 0.62%  | 0.72%  | 2.35%  | 90.77% | 3.61%  | 1.06%  | 0.87%        |
| Ba           | 0.17%  | 0.07%  | 0.88%  | 4.32%  | 86.46% | 3.04%  | 5.07%        |
| B            | 0.00%  | 0.06%  | 0.06%  | 0.50%  | 0.95%  | 90.22% | 8.20%        |
| Caa or below | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.18%  | 0.37%  | 99.45%       |

## Summary Comparisons and Some Interpretations

---

In comparing structured finance to corporate rating transitions, we have found that:

- Structured finance ratings have been less likely to change than corporate ratings, over both one-year and multi-year horizons.
- When structured securities have experienced rating changes, their downgrade-to-upgrade ratio has been lower than that of corporates.
- When there are rating changes in structured finance, they have been of larger magnitude on average than those of corporates.
- Overall, structured finance ratings have been more stable than corporate ratings, as the effect of structured securities' lower frequency of rating changes has more than outweighed their greater propensity for large rating changes when rating changes do occur.
- For speculative-grade securities, migration rates to the lowest rating categories (Caa or below) have been much lower for structured finance than for corporate ratings, over both short and long horizons.
- For investment-grade securities, migration rates to the lowest rating categories have been higher for structured finance than for corporate ratings, over both short and long horizons.
- Like corporate securities, structured finance securities undergoing rating changes in one year are much more likely to sustain further changes in the same direction in the following year, in comparison to securities that experience no rating change or a change in the opposite direction.

While it is by no means clear that we can expect these observed differences and similarities to persist over time, it is worthwhile to consider some of the possible explanations for these findings. These explanations include:

- Structured finance securities may have experienced more stability than corporate ratings because Aaa-rated securities are more common and Aaa ratings tend to be particularly stable. At the beginning of 2002, about one third of all structured securities carried Aaa ratings, compared to merely 1.5% of all corporate ratings.
- The relative rating stability in structured finance may also be explained in part by the numerous instances in which originators or servicers of structured securities have supported troubled transactions, something typically not considered in rating assignments in structured finance, and thereby averted rating transitions on the affected securities.
- The higher propensity of investment-grade structured securities (relative to corporate investment-grade securities) to transition into the lowest rating category may be explained by the structured finance sector's large concentration in exposure to high yield bonds issued in the late 1990s and exposure to the credit strength of GreenTree/Conseco.
- Asset pools originated or serviced by weak corporate entities are often structured with high levels of credit enhancement that make rating changes less likely to respond to modest changes in pool performance, but nonetheless may require sharp rating downgrades if the servicer's credit quality deteriorates or the servicer or originator commits fraud. This may partially explain the stability and larger size of rating actions in structured finance than in corporate finance.
- There are differences in the evolutions of credit risk between the structured and corporate sectors. In the corporate sector, as an issuer's credit circumstances change, Moody's ratings often change gradually, as more is learned over time about how management is reacting to the changed circumstances. In structured finance, however, the underlying asset pool is often fixed so that as pool performance begins to deviate from expected performance, there is generally little likelihood that this deviation will be reversed over time, and therefore less reason to take a gradual approach to rating changes. This helps explain why, when changed, structured finance ratings tend to move in larger steps than corporate ratings if rating adjustments are required.

## Appendix I: Methodology

---

### EXCLUSION OF GUARANTEED SECURITIES AND SINGLE-RATING PASS-THROUGHS

We decided to exclude all structured securities that are either guaranteed by a federal agency or a GSE such as Fannie Mae and Freddie Mac, or by one of the financial guaranty insurers. This is because the ratings on these wrapped securities are from these guarantors, and these guarantors have always been rated Aaa. The majority of agency-guaranteed securities are in the RMBS sector, while most of the securities excluded due to a financial wrap by one of the four big financial guarantors – MBIA, FSA, AMBAC, and FGIC – are in the ABS sector.

We also have chosen not to include any other pure single-name rating pass-throughs. Although not guaranteed, a large number of structured notes and some CMBS lease-backed securities directly inherited a single corporate (or a single sovereign) rating. In other words, the ratings on these securities have effectively a 100 percent correlation with the single ratings that support them. These securities are excluded. The sample does include securities whose ratings could practically be influenced by the ratings of two (or more) securities or issuers, even if one of them plays a dominant role. For example, we include ratings on repackaged securities because the default risks of both the bond in the asset and the swap counterparty could potentially affect the rating of the security. For these securities, it is mainly the rating of the bond in the asset that determines the rating of the security, however, in this paper we do not treat them as having a 100 percent correlation. Similarly, the structured finance transactions supported by Green Tree/Conseco were included in the sample.

### INCLUSION OF EARLIEST OBSERVATIONS

There are few observations in structured finance in the 1980s, particularly in the early 1980s. Although we choose to include them for the sake of sample completeness, we also show additional exhibits in the appendix that cover only the more recent periods (see Exhibit 26 in Appendix 2). Since most of the statistical analysis in this study uses weighted average values, the impact of these earliest observations on the aggregate statistics is very low.

### ABOUT RATING TRANSITION INTERVALS

Following the same methods used in our past rating transition studies, we first form rating-year cohorts. For each structured finance security, we track its year-end ratings (or equivalently the next year-start ratings). We do not track individual rating changes during a year; rather, we only track the beginning and end-of-year ratings. For each rating year cohort, we then compute percentages of ratings migrating from one rating category to another over defined horizons varying from one year to a number of years. These rating transition percentages are then averaged over years, weighted by the size of each rating-year cohort.

### TREATMENT OF WITHDRAWN RATINGS

In most of the text, we report rating transitions that have been calculated by excluding withdrawn ratings (WRs). Exhibits that show these WR-excluded statistics are labeled as “Adjusted for Withdrawn Ratings”.<sup>7</sup> Otherwise, exhibits are labeled as “Unadjusted for Withdrawn Ratings”,<sup>8</sup> and the frequency with which ratings were withdrawn is reported explicitly. All transition matrices unadjusted for withdrawn ratings are in Appendix 2.

### TREATMENT OF BROAD VS. REFINED RATINGS

We also distinguish between transitions that are based on “broad”-ratings (i.e. with no numeric modifiers) and “refined” ratings (i.e. with numeric modifiers). Most of the exhibits and analysis in the text are broad-rating-based.

### TREATMENT OF MULTI-NOTCH RATING CHANGES

Finally, in calculating aggregate downgrade and upgrade frequencies of all refined ratings, we have occasionally adjusted for the number of notches per rating move – a rating move of three notches (on a refined-rating scale), for instance, is considered as three rating changes. When such adjustment is made, we label them “Adjusted for the Number of Notches per Rating Move”. Aggregate downgrade and upgrade frequencies based on broad-ratings are typically not adjusted for the number of notches per rating move. All refined-rating-based transition matrices are presented in appendix 2.

7. This adjustment simply removes all securities – from both the beginning and end-of-period cohorts – whose ratings were withdrawn during the period being analyzed.

8. Most of the statistics in the appendix are unadjusted for withdrawn ratings. To convert them into rating transition percentages adjusted for withdrawn ratings, readers can divide unadjusted rating transition percentages by one minus the percentage of securities that were withdrawn. Additionally, the vast majority of withdrawn structured securities were simply the results of deal pay-down and maturity, in other words, almost always not credit-risk related.

## Appendix II: Transition Matrices

### EXHIBIT 25: ALL STRUCTURED FINANCE ANNUAL RATING TRANSITION MATRIX, 1983-2002

| All Structured Finance Annual Rating Transition Matrix, 1983-2002 |        |        |        |        |        |        |              |        |
|---|--------|--------|--------|--------|--------|--------|--------------|--------|
|   | TO:    |        |        |        |        |        |              |        |
| FROM:   | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
| Aaa   | 89.92% | 0.81%  | 0.12%  | 0.04%  | 0.00%  | 0.00%  | 0.03%        | 9.08%  |
| Aa  | 5.15%  | 86.34% | 2.15%  | 0.60%  | 0.08%  | 0.03%  | 0.06%        | 5.59%  |
| A   | 1.05%  | 2.54%  | 86.90% | 1.69%  | 0.48%  | 0.06%  | 0.17%        | 7.10%  |
| Baa   | 0.51%  | 0.63%  | 2.17%  | 86.93% | 3.68%  | 1.21%  | 1.04%        | 3.83%  |
| Ba  | 0.14%  | 0.06%  | 0.75%  | 3.84%  | 83.09% | 3.11%  | 5.26%        | 3.75%  |
| B   | 0.00%  | 0.05%  | 0.05%  | 0.44%  | 0.82%  | 85.54% | 9.26%        | 3.83%  |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.15%  | 0.30%  | 86.72%       | 12.84% |

| All Corporate Finance Annual Rating Transition Matrix, 1983-2002 |        |        |        |        |        |        |              |         |        |
|--|--------|--------|--------|--------|--------|--------|--------------|---------|--------|
|  | TO:    |        |        |        |        |        |              |         |        |
| FROM:  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | Default | WR     |
| Aaa  | 86.09% | 8.79%  | 0.96%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        | 0.00%   | 4.16%  |
| Aa   | 0.76%  | 86.18% | 8.69%  | 0.36%  | 0.09%  | 0.02%  | 0.00%        | 0.03%   | 3.87%  |
| A  | 0.04%  | 2.43%  | 86.97% | 5.54%  | 0.67%  | 0.21%  | 0.02%        | 0.02%   | 4.10%  |
| Baa  | 0.05%  | 0.27%  | 5.63%  | 82.40% | 4.97%  | 1.06%  | 0.17%        | 0.22%   | 5.24%  |
| Ba   | 0.01%  | 0.03%  | 0.56%  | 5.02%  | 75.31% | 8.22%  | 0.68%        | 1.36%   | 8.81%  |
| B  | 0.01%  | 0.05%  | 0.21%  | 0.56%  | 5.67%  | 74.40% | 3.84%        | 6.86%   | 8.40%  |
| Caa or below   | 0.00%  | 0.00%  | 0.00%  | 0.91%  | 2.31%  | 5.87%  | 54.44%       | 26.29%  | 10.18% |

### EXHIBIT 26: ALL STRUCTURED FINANCE ANNUAL RATING TRANSITION MATRIX, 1995-2002

|              | TO:    |        |        |        |        |        |              |        |
|--------------|--------|--------|--------|--------|--------|--------|--------------|--------|
| FROM:        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
| Aaa          | 89.72% | 0.61%  | 0.12%  | 0.04%  | 0.00%  | 0.00%  | 0.03%        | 9.47%  |
| Aa           | 5.12%  | 85.76% | 1.71%  | 0.62%  | 0.11%  | 0.02%  | 0.07%        | 6.59%  |
| A            | 1.08%  | 2.23%  | 87.05% | 1.38%  | 0.50%  | 0.07%  | 0.18%        | 7.51%  |
| Baa          | 0.54%  | 0.63%  | 2.20%  | 86.85% | 3.54%  | 1.21%  | 1.05%        | 3.96%  |
| Ba           | 0.09%  | 0.06%  | 0.77%  | 3.88%  | 83.02% | 3.11%  | 5.36%        | 3.71%  |
| B            | 0.00%  | 0.06%  | 0.06%  | 0.45%  | 0.84%  | 85.71% | 9.13%        | 3.75%  |
| Caa or below | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.15%  | 0.30%  | 86.99%       | 12.56% |

### EXHIBIT 27: U.S. STRUCTURED FINANCE ANNUAL RATING TRANSITION MATRIX, 1983-2002

|              | TO:    |        |        |        |        |        |              |        |
|--------------|--------|--------|--------|--------|--------|--------|--------------|--------|
| FROM:        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
| Aaa          | 89.81% | 0.63%  | 0.09%  | 0.03%  | 0.00%  | 0.00%  | 0.03%        | 9.40%  |
| Aa           | 5.65%  | 86.30% | 1.92%  | 0.52%  | 0.06%  | 0.03%  | 0.06%        | 5.47%  |
| A            | 1.14%  | 2.24%  | 87.15% | 1.54%  | 0.46%  | 0.07%  | 0.16%        | 7.25%  |
| Baa          | 0.60%  | 0.69%  | 2.26%  | 87.38% | 3.47%  | 1.02%  | 0.84%        | 3.74%  |
| Ba           | 0.16%  | 0.07%  | 0.85%  | 4.17%  | 83.47% | 2.93%  | 4.89%        | 3.46%  |
| B            | 0.00%  | 0.06%  | 0.06%  | 0.48%  | 0.91%  | 86.67% | 7.93%        | 3.88%  |
| Caa or below | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.16%  | 0.32%  | 86.58%       | 12.94% |

**Exhibit 28: ALL STRUCTURED FINANCE ANNUAL RATING TRANSITION MATRIX, 1983-2002**

| TO:  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| FROM | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1  | Caa2  | Caa3  | Ca    | C     | WR    |
| Aaa  | 89.9% | 0.4%  | 0.2%  | 0.2%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 9.1%  |
| Aa1  | 10.7% | 75.7% | 3.3%  | 0.9%  | 0.3%  | 0.0%  | 0.2%  | 0.0%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 8.5%  |
| Aa2  | 4.6%  | 1.9%  | 85.0% | 1.5%  | 0.7%  | 0.5%  | 0.4%  | 0.1%  | 0.1%  | 0.2%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 4.8%  |
| Aa3  | 2.6%  | 1.8%  | 2.0%  | 81.4% | 3.0%  | 0.9%  | 1.0%  | 0.5%  | 0.4%  | 0.4%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.1%  | 0.0%  | 5.7%  |
| A1   | 1.4%  | 0.7%  | 1.3%  | 2.9%  | 79.0% | 2.5%  | 1.4%  | 0.3%  | 0.4%  | 0.4%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.1%  | 0.0%  | 0.1%  | 0.0%  | 9.2%  |
| A2   | 0.8%  | 0.3%  | 0.9%  | 0.8%  | 2.3%  | 86.3% | 0.4%  | 0.4%  | 0.4%  | 0.5%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 6.6%  |
| A3   | 1.4%  | 0.2%  | 0.6%  | 0.7%  | 0.6%  | 0.9%  | 83.5% | 0.8%  | 1.6%  | 1.3%  | 0.6%  | 0.3%  | 0.5%  | 0.0%  | 0.1%  | 0.0%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.0%  | 6.4%  |
| Baa1 | 1.1%  | 0.2%  | 0.5%  | 0.1%  | 1.3%  | 1.6%  | 1.0%  | 79.4% | 0.7%  | 2.2%  | 4.4%  | 0.5%  | 0.5%  | 0.3%  | 0.3%  | 0.1%  | 0.3%  | 0.2%  | 0.0%  | 0.3%  | 0.0%  | 5.1%  |
| Baa2 | 0.4%  | 0.2%  | 0.4%  | 0.3%  | 0.5%  | 0.8%  | 1.1%  | 0.8%  | 86.8% | 0.9%  | 1.0%  | 0.8%  | 0.6%  | 0.4%  | 0.3%  | 0.5%  | 0.1%  | 0.3%  | 0.2%  | 0.2%  | 0.1%  | 3.6%  |
| Baa3 | 0.4%  | 0.1%  | 0.3%  | 0.0%  | 0.3%  | 0.6%  | 0.3%  | 0.9%  | 0.7%  | 84.9% | 1.3%  | 1.5%  | 2.0%  | 0.4%  | 0.6%  | 0.5%  | 0.3%  | 0.3%  | 0.2%  | 0.4%  | 0.2%  | 3.7%  |
| Ba1  | 0.3%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.9%  | 0.4%  | 0.4%  | 1.0%  | 8.7%  | 73.5% | 1.6%  | 2.1%  | 1.3%  | 1.1%  | 2.1%  | 0.9%  | 1.4%  | 0.3%  | 0.6%  | 0.1%  | 3.3%  |
| Ba2  | 0.2%  | 0.0%  | 0.1%  | 0.1%  | 0.1%  | 0.2%  | 0.2%  | 0.4%  | 1.1%  | 1.3%  | 1.0%  | 83.7% | 0.7%  | 0.9%  | 1.0%  | 1.0%  | 0.6%  | 0.8%  | 0.8%  | 1.2%  | 1.0%  | 3.7%  |
| Ba3  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.3%  | 0.3%  | 0.3%  | 0.2%  | 0.4%  | 0.9%  | 0.4%  | 0.6%  | 81.7% | 0.8%  | 0.8%  | 1.0%  | 1.9%  | 0.8%  | 1.6%  | 1.8%  | 2.1%  | 4.2%  |
| B1   | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.3%  | 0.0%  | 1.0%  | 0.0%  | 80.0% | 1.0%  | 3.5%  | 2.5%  | 0.8%  | 1.3%  | 3.0%  | 3.0%  | 3.5%  |
| B2   | 0.0%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.1%  | 0.0%  | 0.3%  | 0.1%  | 0.4%  | 0.0%  | 0.4%  | 0.5%  | 0.8%  | 86.6% | 1.0%  | 1.3%  | 0.8%  | 0.8%  | 2.3%  | 1.0%  | 3.8%  |
| B3   | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.2%  | 0.2%  | 0.2%  | 0.3%  | 0.3%  | 0.8%  | 81.5% | 2.2%  | 2.8%  | 1.4%  | 2.7%  | 3.3%  | 4.1%  |
| Caa1 | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.6%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 75.8% | 3.9%  | 4.5%  | 4.5%  | 6.2%  | 4.5%  |
| Caa2 | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.7%  | 0.0%  | 73.5% | 0.0%  | 8.1%  | 9.6%  | 8.1%  |
| Caa3 | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 75.6% | 2.6%  | 9.0%  | 12.8% |
| Ca   | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.5%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 79.9% | 5.7%  | 13.9% |
| C    | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 64.3% | 35.7% |

## Exhibit 29: Annual Rating Transition Matrices in Structured Finance Sectors, 1983-2002

| ABS, 1983-2002    |        |        |        |        |        |        |              |        |
|-------------------|--------|--------|--------|--------|--------|--------|--------------|--------|
|                   | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
| Aaa               | 87.21% | 0.75%  | 0.03%  | 0.01%  | 0.00%  | 0.00%  | 0.07%        | 11.93% |
| Aa                | 2.36%  | 88.74% | 1.67%  | 0.62%  | 0.07%  | 0.00%  | 0.22%        | 6.32%  |
| A                 | 0.58%  | 0.97%  | 87.96% | 1.06%  | 0.58%  | 0.07%  | 0.09%        | 8.68%  |
| Baa               | 0.56%  | 0.44%  | 0.92%  | 85.74% | 6.25%  | 1.16%  | 0.68%        | 4.25%  |
| Ba                | 0.27%  | 0.13%  | 0.40%  | 7.09%  | 71.12% | 5.35%  | 11.10%       | 4.55%  |
| B                 | 0.00%  | 0.00%  | 0.00%  | 0.57%  | 0.00%  | 73.14% | 21.71%       | 4.57%  |
| Caa or below      | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 77.98%       | 22.02% |
| CDO, 1991-2002    |        |        |        |        |        |        |              |        |
|                   | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
| Aaa               | 89.12% | 2.89%  | 0.87%  | 0.48%  | 0.10%  | 0.00%  | 0.00%        | 6.54%  |
| Aa                | 0.56%  | 85.27% | 5.25%  | 3.35%  | 1.00%  | 0.22%  | 0.11%        | 4.24%  |
| A                 | 0.15%  | 0.90%  | 82.36% | 5.53%  | 1.79%  | 0.30%  | 0.90%        | 8.07%  |
| Baa               | 0.00%  | 0.08%  | 0.49%  | 81.97% | 5.87%  | 3.51%  | 3.18%        | 4.89%  |
| Ba                | 0.00%  | 0.00%  | 0.00%  | 1.34%  | 79.43% | 5.69%  | 11.04%       | 2.51%  |
| B                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 66.52% | 29.91%       | 3.57%  |
| Caa or below      | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 96.43%       | 3.57%  |
| CMBS, 1988-2002   |        |        |        |        |        |        |              |        |
|                   | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
| Aaa               | 88.67% | 1.43%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        | 9.90%  |
| Aa                | 5.11%  | 85.67% | 0.66%  | 0.16%  | 0.00%  | 0.16%  | 0.08%        | 8.15%  |
| A                 | 1.36%  | 3.05%  | 88.52% | 1.36%  | 0.00%  | 0.00%  | 0.00%        | 5.70%  |
| Baa               | 0.59%  | 1.19%  | 2.90%  | 89.06% | 1.38%  | 0.26%  | 0.20%        | 4.41%  |
| Ba                | 0.00%  | 0.00%  | 0.57%  | 2.41%  | 90.77% | 1.70%  | 0.43%        | 4.12%  |
| B                 | 0.00%  | 0.00%  | 0.16%  | 0.63%  | 1.73%  | 91.81% | 2.36%        | 3.31%  |
| Caa or below      | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 2.50%  | 90.00%       | 7.50%  |
| RMBS, 1983-2002   |        |        |        |        |        |        |              |        |
|                   | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
| Aaa               | 92.49% | 0.45%  | 0.13%  | 0.03%  | 0.00%  | 0.00%  | 0.00%        | 6.90%  |
| Aa                | 7.05%  | 85.91% | 2.05%  | 0.40%  | 0.00%  | 0.00%  | 0.00%        | 4.58%  |
| A                 | 1.98%  | 4.09%  | 87.49% | 2.06%  | 0.20%  | 0.03%  | 0.20%        | 3.95%  |
| Baa               | 0.65%  | 0.74%  | 3.27%  | 89.44% | 1.83%  | 0.83%  | 0.86%        | 2.39%  |
| Ba                | 0.21%  | 0.07%  | 1.37%  | 3.97%  | 87.48% | 1.71%  | 2.39%        | 2.80%  |
| B                 | 0.00%  | 0.13%  | 0.00%  | 0.40%  | 0.53%  | 88.25% | 6.41%        | 4.27%  |
| Caa or below      | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.24%  | 0.00%  | 87.08%       | 12.68% |
| OTHERS, 1990-2002 |        |        |        |        |        |        |              |        |
|                   | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
| Aaa               | 83.36% | 3.80%  | 0.15%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        | 12.70% |
| Aa                | 0.29%  | 84.37% | 3.76%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        | 11.58% |
| A                 | 0.00%  | 11.75% | 69.50% | 1.75%  | 1.00%  | 0.00%  | 0.25%        | 15.75% |
| Baa               | 0.00%  | 0.00%  | 4.29%  | 67.86% | 8.57%  | 1.43%  | 2.14%        | 15.71% |
| Ba                | 0.00%  | 0.00%  | 0.00%  | 2.38%  | 75.00% | 1.19%  | 2.38%        | 19.05% |
| B                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 95.35% | 2.33%        | 2.33%  |
| Caa or below      | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 85.71%       | 14.29% |

Note: In this exhibit, each sector uses all of its available rating observations.

**Exhibit 30: ABS Annual Rating Transition Matrix, 1983-2002**

|      |       | TO:   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| FROM | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1  | Caa2  | Caa3  | Ca    | C     | WR    |
| Aaa  | 87.2% | 0.3%  | 0.2%  | 0.2%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 11.9% |
| Aa1  | 5.4%  | 69.5% | 6.8%  | 4.7%  | 0.4%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 13.3% |
| Aa2  | 2.6%  | 0.3%  | 88.6% | 1.9%  | 0.3%  | 0.3%  | 0.6%  | 0.1%  | 0.3%  | 0.0%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 5.0%  |
| Aa3  | 0.9%  | 1.0%  | 0.6%  | 85.8% | 0.7%  | 1.4%  | 1.0%  | 0.5%  | 0.9%  | 0.0%  | 0.0%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.5%  | 0.1%  | 6.6%  |
| A1   | 0.8%  | 0.3%  | 0.4%  | 0.6%  | 83.1% | 0.7%  | 0.4%  | 0.1%  | 0.5%  | 0.5%  | 0.0%  | 0.2%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.1%  | 0.0%  | 12.3% |
| A2   | 0.5%  | 0.1%  | 0.4%  | 0.5%  | 2.4%  | 87.2% | 0.2%  | 0.3%  | 0.4%  | 0.2%  | 0.2%  | 0.2%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 7.4%  |
| A3   | 0.4%  | 0.0%  | 0.4%  | 0.1%  | 0.3%  | 0.9%  | 83.0% | 0.7%  | 1.0%  | 0.4%  | 1.2%  | 0.3%  | 0.3%  | 0.0%  | 0.4%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.1%  | 10.1% |
| Baa1 | 1.0%  | 0.2%  | 0.2%  | 0.2%  | 0.5%  | 0.5%  | 0.5%  | 78.0% | 0.7%  | 1.2%  | 10.4% | 0.5%  | 1.0%  | 0.5%  | 0.5%  | 0.2%  | 0.2%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 3.6%  |
| Baa2 | 0.0%  | 0.1%  | 0.2%  | 0.2%  | 0.4%  | 0.2%  | 0.1%  | 0.1%  | 89.3% | 0.7%  | 1.1%  | 1.2%  | 0.7%  | 0.2%  | 0.7%  | 0.3%  | 0.1%  | 0.1%  | 0.0%  | 0.3%  | 0.1%  | 3.6%  |
| Baa3 | 1.4%  | 0.0%  | 0.0%  | 0.0%  | 0.1%  | 0.6%  | 0.1%  | 1.0%  | 0.4%  | 79.4% | 2.0%  | 2.7%  | 4.5%  | 0.1%  | 0.7%  | 0.3%  | 0.1%  | 0.3%  | 0.0%  | 0.3%  | 0.1%  | 5.9%  |
| Ba1  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.7%  | 0.0%  | 0.0%  | 36.4% | 39.2% | 1.4%  | 4.9%  | 2.1%  | 2.1%  | 4.9%  | 0.7%  | 5.6%  | 0.0%  | 0.0%  | 0.7%  | 1.4%  |
| Ba2  | 0.5%  | 0.0%  | 0.0%  | 0.2%  | 0.2%  | 0.2%  | 0.0%  | 0.2%  | 0.0%  | 0.0%  | 0.5%  | 80.0% | 0.7%  | 1.8%  | 2.5%  | 1.2%  | 1.2%  | 2.3%  | 1.6%  | 2.3%  | 1.2%  | 3.5%  |
| Ba3  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 67.3% | 0.0%  | 1.8%  | 0.0%  | 2.3%  | 2.9%  | 5.8%  | 3.5%  | 6.4%  | 9.9%  |
| B1   | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 66.7% | 0.0%  | 10.0% | 3.3%  | 0.0%  | 3.3%  | 6.7%  | 3.3%  | 6.7%  |
| B2   | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.8%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 78.2% | 0.0%  | 1.6%  | 2.4%  | 2.4%  | 5.6%  | 4.8%  | 4.0%  |
| B3   | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 38.1% | 0.0%  | 19.0% | 9.5%  | 14.3% | 14.3% | 4.8%  |
| Caa1 | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 50.0% | 12.5% | 0.0%  | 0.0%  | 18.8% | 18.8% |
| Caa2 | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 41.7% | 0.0%  | 29.2% | 29.2% | 0.0%  |
| Caa3 | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 60.0% | 0.0%  | 10.0% | 30.0% |
| Ca   | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 65.6% | 3.1%  | 31.3% |
| C    | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 70.4% | 29.6% |

**Exhibit 31: CDO Annual Rating Transition Matrix, 1991-2002**

| TO:  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|
| FROM | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1  | Caa2  | Caa3 | Ca    | C     | WR    |
| Aaa  | 89.1% | 1.2%  | 1.2%  | 0.6%  | 0.4%  | 0.2%  | 0.3%  | 0.3%  | 0.0%  | 0.2%  | 0.0%  | 0.0%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.0%  | 0.0%  | 6.5%  |
| Aa1  | 1.9%  | 76.0% | 4.8%  | 3.8%  | 1.0%  | 0.0%  | 1.0%  | 0.0%  | 0.0%  | 1.0%  | 1.0%  | 0.0%  | 1.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.0%  | 0.0%  | 8.7%  |
| Aa2  | 0.3%  | 0.5%  | 84.1% | 2.9%  | 3.0%  | 0.8%  | 0.7%  | 1.2%  | 0.3%  | 1.4%  | 0.2%  | 0.2%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.2%  | 0.0%  | 0.0% | 0.0%  | 0.0%  | 4.2%  |
| Aa3  | 0.5%  | 0.0%  | 1.5%  | 77.5% | 5.5%  | 1.5%  | 2.0%  | 2.5%  | 0.5%  | 3.0%  | 1.0%  | 0.5%  | 1.0%  | 1.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.0%  | 0.0%  | 2.0%  |
| A1   | 0.0%  | 0.0%  | 1.8%  | 1.8%  | 62.8% | 2.7%  | 7.1%  | 0.0%  | 1.8%  | 3.5%  | 1.8%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.0%  | 0.9%  | 15.9% |
| A2   | 0.4%  | 0.0%  | 0.4%  | 0.4%  | 2.2%  | 79.6% | 1.5%  | 0.7%  | 1.9%  | 1.9%  | 0.7%  | 0.0%  | 0.0%  | 0.0%  | 0.4%  | 0.4%  | 0.0%  | 0.0%  | 0.0% | 0.0%  | 0.0%  | 9.7%  |
| A3   | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.7%  | 84.7% | 1.7%  | 3.1%  | 1.7%  | 1.0%  | 0.3%  | 1.4%  | 0.0%  | 0.0%  | 0.0%  | 1.0%  | 0.3%  | 0.3% | 0.0%  | 0.0%  | 3.5%  |
| Baa1 | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.9%  | 0.0%  | 0.0%  | 78.0% | 0.0%  | 2.8%  | 0.9%  | 1.8%  | 0.9%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 1.8%  | 0.0% | 0.0%  | 0.0%  | 12.8% |
| Baa2 | 0.0%  | 0.2%  | 0.0%  | 0.0%  | 0.0%  | 0.2%  | 0.6%  | 0.0%  | 81.7% | 1.9%  | 2.2%  | 0.9%  | 1.1%  | 1.7%  | 0.3%  | 1.7%  | 0.2%  | 1.3%  | 1.3% | 0.3%  | 0.2%  | 4.4%  |
| Baa3 | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.2%  | 0.0%  | 79.9% | 2.1%  | 3.6%  | 2.9%  | 1.7%  | 1.3%  | 1.0%  | 0.8%  | 1.0%  | 0.6% | 0.6%  | 0.4%  | 3.8%  |
| Ba1  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 67.7% | 8.1%  | 1.6%  | 3.2%  | 6.5%  | 3.2%  | 3.2%  | 3.2%  | 0.0% | 1.6%  | 0.0%  | 1.6%  |
| Ba2  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.7%  | 1.3%  | 0.0%  | 75.4% | 1.7%  | 1.7%  | 2.3%  | 2.0%  | 2.0%  | 1.7%  | 2.7% | 3.7%  | 3.0%  | 2.0%  |
| Ba3  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.9%  | 0.0%  | 0.0%  | 83.0% | 2.1%  | 0.4%  | 0.9%  | 2.1%  | 0.4%  | 1.3% | 2.6%  | 3.0%  | 3.4%  |
| B1   | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 55.6% | 0.0%  | 6.7%  | 5.6%  | 3.3%  | 4.4% | 11.1% | 11.1% | 2.2%  |
| B2   | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 77.2% | 3.5%  | 1.8%  | 1.8%  | 1.8% | 8.8%  | 1.8%  | 3.5%  |
| B3   | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 61.0% | 2.6%  | 7.8%  | 5.2% | 7.8%  | 10.4% | 5.2%  |
| Caa1 | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 33.3% | 0.0%  | 5.6% | 33.3% | 22.2% | 5.6%  |
| Caa2 | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 30.0% | 0.0% | 20.0% | 50.0% | 0.0%  |
| Caa3 | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 14.3% | 71.4% | 14.3% |
| Ca   | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 30.8% | 69.2% | 0.0%  |
| C    | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.0%  | 100%  | 0.0%  |



**Exhibit 32: CMBS Annual Rating Transition Matrix, 1988-2002**

| TO:  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|
| FROM | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1  | Caa2  | Caa3 | Ca    | C     | WR    |
| Aaa  | 88.7% | 0.8%  | 0.4%  | 0.2%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.0%  | 0.0%  | 9.9%  |
| Aa1  | 7.9%  | 76.3% | 0.7%  | 0.7%  | 1.4%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.7%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.0%  | 0.0%  | 12.2% |
| Aa2  | 4.7%  | 2.0%  | 84.4% | 0.6%  | 0.3%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.1%  | 0.1%  | 0.0%  | 0.0% | 0.0%  | 0.0%  | 7.6%  |
| Aa3  | 5.4%  | 0.9%  | 2.7%  | 80.2% | 0.0%  | 0.9%  | 0.9%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.9%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.0%  | 0.0%  | 8.1%  |
| A1   | 4.2%  | 0.7%  | 0.7%  | 1.4%  | 79.9% | 0.0%  | 2.1%  | 0.7%  | 0.7%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.0%  | 0.0%  | 9.7%  |
| A2   | 1.3%  | 0.7%  | 1.5%  | 1.0%  | 3.0%  | 86.2% | 0.5%  | 0.5%  | 0.4%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.0%  | 0.0%  | 4.9%  |
| A3   | 0.0%  | 0.0%  | 0.4%  | 2.3%  | 1.1%  | 0.4%  | 87.0% | 0.0%  | 0.8%  | 1.9%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.0%  | 0.0%  | 6.1%  |
| Baa1 | 2.8%  | 0.7%  | 2.8%  | 0.0%  | 2.1%  | 2.1%  | 0.0%  | 76.6% | 0.0%  | 1.4%  | 0.7%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.7%  | 0.0%  | 0.0% | 0.0%  | 0.0%  | 9.9%  |
| Baa2 | 0.6%  | 0.1%  | 0.7%  | 0.2%  | 0.5%  | 1.1%  | 1.9%  | 1.8%  | 86.7% | 0.7%  | 0.4%  | 0.5%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.1%  | 0.1%  | 4.2%  |
| Baa3 | 0.0%  | 0.0%  | 0.5%  | 0.2%  | 0.2%  | 0.9%  | 0.5%  | 1.8%  | 2.4%  | 87.5% | 1.1%  | 0.2%  | 0.9%  | 0.2%  | 0.4%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.0%  | 0.0%  | 3.3%  |
| Ba1  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.7%  | 0.7%  | 0.0%  | 0.7%  | 0.7%  | 89.3% | 1.3%  | 1.3%  | 0.7%  | 0.0%  | 0.0%  | 0.7%  | 0.0%  | 0.0% | 0.0%  | 0.0%  | 4.0%  |
| Ba2  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.3%  | 0.0%  | 0.3%  | 0.0%  | 1.2%  | 1.7%  | 1.7%  | 86.9% | 0.9%  | 1.2%  | 0.0%  | 0.3%  | 0.0%  | 0.0%  | 0.0% | 0.0%  | 0.0%  | 5.5%  |
| Ba3  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.5%  | 0.0%  | 1.9%  | 1.9%  | 1.9%  | 88.2% | 1.4%  | 0.9%  | 0.5%  | 0.5%  | 0.5%  | 0.0% | 0.0%  | 0.0%  | 1.9%  |
| B1   | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.9%  | 0.0%  | 1.9%  | 0.0%  | 89.7% | 0.0%  | 0.9%  | 0.9%  | 0.0%  | 0.0% | 0.0%  | 0.0%  | 5.6%  |
| B2   | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.3%  | 0.0%  | 0.3%  | 0.0%  | 0.6%  | 0.0%  | 1.0%  | 1.3%  | 1.0%  | 89.5% | 1.0%  | 1.0%  | 0.6%  | 0.3% | 0.0%  | 0.0%  | 3.2%  |
| B3   | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.5%  | 0.0%  | 0.5%  | 0.9%  | 1.4%  | 90.6% | 0.5%  | 2.3%  | 0.5% | 0.0%  | 0.5%  | 2.3%  |
| Caa1 | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 70.0% | 0.0%  | 0.0% | 0.0%  | 10.0% | 20.0% |
| Caa2 | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 1.6%  | 0.0%  | 91.8% | 0.0% | 1.6%  | 1.6%  | 3.3%  |
| Caa3 | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.0%  | 0.0%  | 0.0%  |
| Ca   | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 12.5% | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 62.5% | 12.5% | 12.5% |
| C    | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.0%  | 0.0%  | 100%  |

**Exhibit 33: RMBS Annual Rating Transition Matrix, 1983-2002**

| TO:  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| FROM | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1  | Caa2  | Caa3  | Ca    | C     | WR    |
| Aaa  | 92.5% | 0.2%  | 0.2%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 6.9%  |
| Aa1  | 13.9% | 78.3% | 0.4%  | 0.1%  | 0.1%  | 0.1%  | 0.2%  | 0.0%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 6.6%  |
| Aa2  | 5.9%  | 2.4%  | 84.9% | 1.0%  | 0.5%  | 0.6%  | 0.5%  | 0.1%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 3.8%  |
| Aa3  | 4.0%  | 2.6%  | 2.6%  | 79.9% | 3.5%  | 0.6%  | 1.0%  | 0.4%  | 0.2%  | 0.3%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 5.0%  |
| A1   | 2.2%  | 1.4%  | 2.6%  | 1.6%  | 80.3% | 4.2%  | 2.0%  | 0.6%  | 0.3%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.2%  | 0.0%  | 0.1%  | 0.0%  | 4.2%  |
| A2   | 1.3%  | 0.4%  | 2.0%  | 1.7%  | 1.4%  | 87.3% | 0.3%  | 0.5%  | 0.2%  | 0.8%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 4.1%  |
| A3   | 3.1%  | 0.5%  | 1.0%  | 1.0%  | 1.0%  | 0.9%  | 83.7% | 0.8%  | 1.8%  | 1.6%  | 0.1%  | 0.2%  | 0.5%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.1%  | 0.1%  | 0.2%  | 0.0%  | 3.4%  |
| Baa1 | 1.1%  | 0.0%  | 0.2%  | 0.0%  | 2.1%  | 2.5%  | 2.1%  | 83.9% | 1.1%  | 2.3%  | 0.7%  | 0.5%  | 0.2%  | 0.0%  | 0.2%  | 0.0%  | 0.5%  | 0.0%  | 0.0%  | 0.5%  | 0.0%  | 2.1%  |
| Baa2 | 0.9%  | 0.2%  | 0.5%  | 0.4%  | 0.7%  | 1.5%  | 1.6%  | 1.1%  | 87.6% | 0.6%  | 0.5%  | 0.3%  | 0.4%  | 0.1%  | 0.2%  | 0.3%  | 0.1%  | 0.0%  | 0.0%  | 0.2%  | 0.0%  | 2.6%  |
| Baa3 | 0.3%  | 0.1%  | 0.4%  | 0.0%  | 0.5%  | 0.8%  | 0.4%  | 0.4%  | 0.5%  | 89.3% | 0.8%  | 0.7%  | 1.0%  | 0.2%  | 0.4%  | 0.6%  | 0.3%  | 0.1%  | 0.3%  | 0.5%  | 0.1%  | 2.2%  |
| Ba1  | 0.6%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 1.5%  | 0.3%  | 0.9%  | 1.8%  | 2.2%  | 83.7% | 0.6%  | 0.9%  | 0.9%  | 0.0%  | 1.8%  | 0.6%  | 0.0%  | 0.3%  | 0.9%  | 0.0%  | 2.8%  |
| Ba2  | 0.1%  | 0.0%  | 0.1%  | 0.0%  | 0.0%  | 0.4%  | 0.3%  | 0.9%  | 1.8%  | 1.7%  | 1.4%  | 88.1% | 0.4%  | 0.0%  | 0.0%  | 0.9%  | 0.1%  | 0.0%  | 0.0%  | 0.3%  | 0.6%  | 2.8%  |
| Ba3  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.8%  | 0.8%  | 0.8%  | 0.3%  | 1.1%  | 0.8%  | 0.0%  | 0.3%  | 84.0% | 0.0%  | 0.6%  | 1.9%  | 2.5%  | 0.3%  | 0.8%  | 1.4%  | 0.8%  | 2.8%  |
| B1   | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 1.4%  | 0.0%  | 90.3% | 0.7%  | 2.1%  | 2.1%  | 0.0%  | 0.0%  | 0.0%  | 0.7%  | 2.8%  |
| B2   | 0.0%  | 0.3%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.3%  | 0.3%  | 0.0%  | 0.0%  | 0.0%  | 0.3%  | 88.8% | 1.0%  | 1.4%  | 0.0%  | 0.3%  | 2.1%  | 0.3%  | 4.5%  |
| B3   | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.3%  | 0.0%  | 0.3%  | 0.3%  | 0.0%  | 0.3%  | 84.0% | 3.5%  | 0.9%  | 0.3%  | 2.5%  | 2.8%  | 4.7%  |
| Caa1 | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.8%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 85.7% | 3.8%  | 5.3%  | 0.8%  | 2.3%  | 1.5%  |
| Caa2 | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 75.6% | 0.0%  | 2.4%  | 0.0%  | 22.0% |
| Caa3 | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 86.2% | 1.7%  | 1.7%  | 10.3% |
| Ca   | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 89.1% | 0.0%  | 10.9% |
| C    | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 56.3% | 43.8% |

### Exhibit 34: OTHERS Annual Rating Transition Matrix, 1990-2002

| TO:  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |      |       |       |      |       |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|-------|-------|------|-------|
| FROM | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1 | Caa2 | Caa3  | Ca    | C    | WR    |
| Aaa  | 83.4% | 3.5%  | 0.3%  | 0.0%  | 0.0%  | 0.0%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.0% | 0.0%  | 0.0%  | 0.0% | 12.7% |
| Aa1  | 1.0%  | 64.2% | 20.9% | 0.5%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.0% | 0.0%  | 0.0%  | 0.0% | 13.4% |
| Aa2  | 0.0%  | 6.6%  | 66.9% | 10.3% | 3.3%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.0% | 0.0%  | 0.0%  | 0.0% | 12.8% |
| Aa3  | 0.0%  | 1.6%  | 3.6%  | 78.6% | 6.9%  | 0.4%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.0% | 0.0%  | 0.0%  | 0.0% | 8.9%  |
| A1   | 0.0%  | 0.0%  | 0.0%  | 23.0% | 59.3% | 5.9%  | 0.5%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.0% | 0.0%  | 0.0%  | 0.0% | 11.3% |
| A2   | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 9.5%  | 62.7% | 3.2%  | 0.8%  | 0.8%  | 2.4%  | 0.0%  | 0.0%  | 0.8%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.0% | 0.0%  | 0.0%  | 0.0% | 19.8% |
| A3   | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 2.9%  | 67.1% | 1.4%  | 0.0%  | 1.4%  | 2.9%  | 1.4%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.0% | 0.0%  | 1.4%  | 0.0% | 21.4% |
| Baa1 | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 4.3%  | 2.1%  | 61.7% | 0.0%  | 10.6% | 4.3%  | 0.0%  | 0.0%  | 2.1%  | 0.0%  | 0.0%  | 0.0% | 0.0% | 0.0%  | 2.1%  | 0.0% | 12.8% |
| Baa2 | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 6.5%  | 0.0%  | 48.4% | 9.7%  | 9.7%  | 6.5%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 3.2% | 3.2% | 0.0%  | 0.0%  | 0.0% | 12.9% |
| Baa3 | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 1.6%  | 0.0%  | 0.0%  | 8.1%  | 1.6%  | 59.7% | 1.6%  | 3.2%  | 3.2%  | 1.6%  | 0.0%  | 0.0%  | 0.0% | 0.0% | 0.0%  | 0.0%  | 0.0% | 19.4% |
| Ba1  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 4.3%  | 56.5% | 0.0%  | 8.7%  | 0.0%  | 4.3%  | 0.0%  | 0.0% | 0.0% | 4.3%  | 0.0%  | 0.0% | 21.7% |
| Ba2  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 3.4%  | 0.0%  | 72.4% | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.0% | 0.0%  | 0.0%  | 0.0% | 24.1% |
| Ba3  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 3.1%  | 81.3% | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.0% | 0.0%  | 3.1%  | 0.0% | 12.5% |
| B1   | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 82.6% | 13.0% | 4.3%  | 0.0% | 0.0% | 0.0%  | 0.0%  | 0.0% | 0.0%  |
| B2   | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 12.5% | 87.5% | 0.0%  | 0.0% | 0.0% | 0.0%  | 0.0%  | 0.0% | 0.0%  |
| B3   | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 25.0% | 25.0% | 0.0% | 0.0% | 25.0% | 0.0%  | 0.0% | 25.0% |
| Caa1 | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.0% | 0.0%  | 100%  | 0.0% | 0.0%  |
| Caa2 | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.0% | 0.0%  | 0.0%  | 0.0% | 0.0%  |
| Caa3 | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.0% | 100%  | 0.0%  | 0.0% | 0.0%  |
| Ca   | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.0% | 0.0%  | 66.7% | 0.0% | 33.3% |
| C    | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.0% | 0.0%  | 0.0%  | 0.0% | 0.0%  |

**Exhibit 35: International Annual Rating Transition Matrix, 1989-2002**

| TO:  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|
| FROM | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1  | Caa2  | Caa3 | Ca    | C     | WR    |
| Aaa  | 90.7% | 1.3%  | 0.4%  | 0.3%  | 0.1%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.0%  | 0.0%  | 6.9%  |
| Aa1  | 3.0%  | 70.4% | 15.4% | 0.8%  | 0.3%  | 0.0%  | 0.3%  | 0.0%  | 0.0%  | 0.3%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.0%  | 0.0%  | 9.7%  |
| Aa2  | 1.0%  | 2.9%  | 76.4% | 7.8%  | 2.9%  | 0.4%  | 0.3%  | 0.5%  | 0.1%  | 1.0%  | 0.0%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.1%  | 0.0%  | 0.0% | 0.0%  | 0.0%  | 6.5%  |
| Aa3  | 0.8%  | 1.4%  | 3.5%  | 81.2% | 5.4%  | 1.0%  | 0.6%  | 0.4%  | 0.2%  | 0.6%  | 0.2%  | 0.2%  | 0.2%  | 0.2%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.0%  | 0.0%  | 3.9%  |
| A1   | 0.2%  | 0.2%  | 0.4%  | 11.5% | 75.9% | 2.8%  | 1.7%  | 0.0%  | 0.9%  | 0.4%  | 0.4%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.0%  | 0.0%  | 5.4%  |
| A2   | 0.7%  | 0.1%  | 0.3%  | 0.7%  | 2.3%  | 85.8% | 1.3%  | 0.4%  | 1.4%  | 1.0%  | 0.3%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.0%  | 0.0%  | 5.8%  |
| A3   | 0.5%  | 0.5%  | 0.5%  | 0.5%  | 0.0%  | 1.0%  | 82.9% | 1.3%  | 1.6%  | 1.0%  | 0.8%  | 0.3%  | 0.5%  | 0.0%  | 0.0%  | 0.0%  | 0.8%  | 0.0%  | 0.0% | 0.0%  | 0.0%  | 7.8%  |
| Baa1 | 0.0%  | 0.0%  | 0.5%  | 0.5%  | 0.5%  | 1.6%  | 0.0%  | 85.5% | 0.0%  | 3.6%  | 1.0%  | 1.6%  | 0.5%  | 0.5%  | 0.0%  | 0.0%  | 0.0%  | 0.5%  | 0.0% | 0.5%  | 0.0%  | 3.1%  |
| Baa2 | 0.0%  | 0.1%  | 0.0%  | 0.0%  | 0.3%  | 0.6%  | 1.3%  | 0.4%  | 84.1% | 1.6%  | 2.4%  | 0.3%  | 0.9%  | 0.9%  | 0.1%  | 1.2%  | 0.3%  | 0.4%  | 0.6% | 0.4%  | 0.1%  | 3.7%  |
| Baa3 | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.5%  | 1.2%  | 0.2%  | 77.7% | 1.7%  | 3.1%  | 3.1%  | 1.7%  | 0.7%  | 1.0%  | 1.2%  | 0.5%  | 0.7% | 0.5%  | 0.2%  | 6.0%  |
| Ba1  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 2.1%  | 70.5% | 3.2%  | 3.2%  | 3.2%  | 4.2%  | 1.1%  | 3.2%  | 2.1%  | 0.0% | 0.0%  | 0.0%  | 7.4%  |
| Ba2  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.4%  | 0.0%  | 0.8%  | 1.7%  | 0.8%  | 77.7% | 1.7%  | 0.8%  | 0.8%  | 1.2%  | 2.5%  | 1.7%  | 1.7% | 0.8%  | 2.9%  | 4.5%  |
| Ba3  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 1.0%  | 0.0%  | 1.0%  | 82.8% | 2.1%  | 0.5%  | 1.0%  | 1.0%  | 0.0%  | 1.6% | 1.6%  | 1.6%  | 5.7%  |
| B1   | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 61.4% | 2.9%  | 7.1%  | 2.9%  | 1.4%  | 4.3% | 10.0% | 8.6%  | 1.4%  |
| B2   | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 3.9%  | 78.4% | 2.0%  | 2.0%  | 0.0%  | 0.0% | 5.9%  | 2.0%  | 5.9%  |
| B3   | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 1.9%  | 68.5% | 1.9%  | 9.3%  | 3.7% | 5.6%  | 5.6%  | 3.7%  |
| Caa1 | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 36.8% | 10.5% | 0.0% | 26.3% | 10.5% | 15.8% |
| Caa2 | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 55.6% | 0.0% | 22.2% | 22.2% | 0.0%  |
| Caa3 | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.0%  | 75.0% | 25.0% |
| Ca   | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 40.0% | 50.0% | 10.0% |
| C    | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.0%  | 100%  | 0.0%  |

### Exhibit 36: All Structured Finance Multiple-Year Rating Transition Matrices, 1983-2002

| ONE-Year Rating Transition Matrix |         |        |        |        |        |        |              |        |
|-----------------------------------|---------|--------|--------|--------|--------|--------|--------------|--------|
| FROM:                             | TO: Aaa | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
| Aaa                               | 89.92%  | 0.81%  | 0.12%  | 0.04%  | 0.00%  | 0.00%  | 0.03%        | 9.08%  |
| Aa                                | 5.15%   | 86.34% | 2.15%  | 0.60%  | 0.08%  | 0.03%  | 0.06%        | 5.59%  |
| A                                 | 1.05%   | 2.54%  | 86.90% | 1.69%  | 0.48%  | 0.06%  | 0.17%        | 7.10%  |
| Baa                               | 0.51%   | 0.63%  | 2.17%  | 86.93% | 3.68%  | 1.21%  | 1.04%        | 3.83%  |
| Ba                                | 0.14%   | 0.06%  | 0.75%  | 3.84%  | 83.09% | 3.11%  | 5.26%        | 3.75%  |
| B                                 | 0.00%   | 0.05%  | 0.05%  | 0.44%  | 0.82%  | 85.54% | 9.26%        | 3.83%  |
| Caa or below                      | 0.00%   | 0.00%  | 0.00%  | 0.00%  | 0.15%  | 0.30%  | 86.72%       | 12.84% |

| TWO-Year Rating Transition Matrix |         |        |        |        |        |        |              |        |
|-----------------------------------|---------|--------|--------|--------|--------|--------|--------------|--------|
| FROM:                             | TO: Aaa | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
| Aaa                               | 79.51%  | 1.18%  | 0.20%  | 0.08%  | 0.01%  | 0.00%  | 0.07%        | 18.96% |
| Aa                                | 10.62%  | 72.88% | 3.45%  | 1.14%  | 0.22%  | 0.03%  | 0.10%        | 11.57% |
| A                                 | 2.39%   | 5.01%  | 73.54% | 2.03%  | 0.89%  | 0.22%  | 0.45%        | 15.47% |
| Baa                               | 1.10%   | 1.31%  | 4.62%  | 75.63% | 4.59%  | 1.95%  | 2.53%        | 8.28%  |
| Ba                                | 0.38%   | 0.26%  | 1.77%  | 5.43%  | 71.85% | 3.32%  | 8.79%        | 8.19%  |
| B                                 | 0.00%   | 0.15%  | 0.07%  | 1.09%  | 1.53%  | 75.29% | 12.54%       | 9.33%  |
| Caa or below                      | 0.00%   | 0.00%  | 0.00%  | 0.00%  | 0.42%  | 0.63%  | 76.99%       | 21.97% |

| THREE-Year Rating Transition Matrix |         |        |        |        |        |        |              |        |
|-------------------------------------|---------|--------|--------|--------|--------|--------|--------------|--------|
| FROM:                               | TO: Aaa | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
| Aaa                                 | 68.14%  | 1.35%  | 0.29%  | 0.12%  | 0.02%  | 0.00%  | 0.11%        | 29.98% |
| Aa                                  | 16.05%  | 59.79% | 4.05%  | 1.62%  | 0.49%  | 0.11%  | 0.13%        | 17.77% |
| A                                   | 3.87%   | 6.47%  | 59.99% | 2.06%  | 0.80%  | 0.36%  | 0.80%        | 25.65% |
| Baa                                 | 1.68%   | 2.00%  | 7.08%  | 63.79% | 4.35%  | 2.39%  | 5.16%        | 13.53% |
| Ba                                  | 0.77%   | 0.72%  | 3.14%  | 8.50%  | 62.31% | 2.73%  | 8.60%        | 13.23% |
| B                                   | 0.00%   | 0.30%  | 0.10%  | 1.79%  | 1.98%  | 65.77% | 14.48%       | 15.58% |
| Caa or below                        | 0.00%   | 0.00%  | 0.00%  | 0.00%  | 0.90%  | 0.90%  | 67.57%       | 30.63% |

| FOUR-Year Rating Transition Matrix |         |        |        |        |        |        |              |        |
|------------------------------------|---------|--------|--------|--------|--------|--------|--------------|--------|
| FROM:                              | TO: Aaa | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
| Aaa                                | 56.88%  | 1.44%  | 0.30%  | 0.09%  | 0.03%  | 0.01%  | 0.22%        | 41.04% |
| Aa                                 | 21.77%  | 47.70% | 4.33%  | 1.59%  | 0.44%  | 0.22%  | 0.24%        | 23.71% |
| A                                  | 6.50%   | 7.94%  | 47.27% | 1.92%  | 0.72%  | 0.42%  | 1.10%        | 34.13% |
| Baa                                | 2.63%   | 2.75%  | 9.06%  | 54.98% | 5.92%  | 2.12%  | 5.27%        | 17.27% |
| Ba                                 | 1.24%   | 1.39%  | 5.48%  | 11.89% | 54.05% | 1.93%  | 7.41%        | 16.60% |
| B                                  | 0.00%   | 0.47%  | 0.16%  | 3.13%  | 2.66%  | 60.47% | 12.97%       | 20.16% |
| Caa or below                       | 0.00%   | 0.00%  | 0.00%  | 0.00%  | 2.45%  | 1.84%  | 60.74%       | 34.97% |

| FIVE-Year Rating Transition Matrix |         |        |        |        |        |        |              |        |
|------------------------------------|---------|--------|--------|--------|--------|--------|--------------|--------|
| FROM:                              | TO: Aaa | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
| Aaa                                | 47.27%  | 1.18%  | 0.34%  | 0.12%  | 0.01%  | 0.04%  | 0.18%        | 50.87% |
| Aa                                 | 24.34%  | 37.52% | 3.95%  | 1.71%  | 0.46%  | 0.34%  | 0.52%        | 31.16% |
| A                                  | 7.56%   | 8.22%  | 35.62% | 1.78%  | 0.69%  | 0.43%  | 1.12%        | 44.58% |
| Baa                                | 3.72%   | 3.24%  | 10.39% | 46.09% | 4.09%  | 2.25%  | 7.52%        | 22.70% |
| Ba                                 | 1.42%   | 1.72%  | 6.57%  | 13.85% | 44.79% | 1.72%  | 7.18%        | 22.75% |
| B                                  | 0.00%   | 0.41%  | 0.21%  | 4.15%  | 2.90%  | 52.07% | 12.86%       | 27.39% |
| Caa or below                       | 0.00%   | 0.00%  | 0.00%  | 0.00%  | 3.23%  | 2.42%  | 50.81%       | 43.55% |

### Exhibit 37: All Corporate Multiple-Year Rating Transition Matrices, 1983-2002

| <b>ONE-YEAR Rating Transition Matrix</b> |        |        |        |        |        |        |        |         |        |
|--|--------|--------|--------|--------|--------|--------|--------|---------|--------|
|  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  | Default | WR     |
| Aaa                                      | 86.09% | 8.79%  | 0.96%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%   | 4.16%  |
| Aa                                       | 0.76%  | 86.18% | 8.69%  | 0.36%  | 0.09%  | 0.02%  | 0.00%  | 0.03%   | 3.87%  |
| A  | 0.04%  | 2.43%  | 86.97% | 5.54%  | 0.67%  | 0.21%  | 0.02%  | 0.02%   | 4.10%  |
| Baa                                      | 0.05%  | 0.27%  | 5.63%  | 82.40% | 4.97%  | 1.06%  | 0.17%  | 0.22%   | 5.24%  |
| Ba                                       | 0.01%  | 0.03%  | 0.56%  | 5.02%  | 75.31% | 8.22%  | 0.68%  | 1.36%   | 8.81%  |
| B  | 0.01%  | 0.05%  | 0.21%  | 0.56%  | 5.67%  | 74.40% | 3.84%  | 6.86%   | 8.40%  |
| Caa-C                                    | 0.00%  | 0.00%  | 0.00%  | 0.91%  | 2.31%  | 5.87%  | 54.44% | 26.29%  | 10.18% |

| <b>TWO-YEAR Rating Transition Matrix</b> |        |        |        |        |        |        |        |         |        |
|--|--------|--------|--------|--------|--------|--------|--------|---------|--------|
|  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  | Default | WR     |
| Aaa                                      | 74.87% | 15.11% | 1.76%  | 0.00%  | 0.18%  | 0.00%  | 0.00%  | 0.00%   | 8.09%  |
| Aa                                       | 1.31%  | 73.96% | 15.28% | 1.10%  | 0.33%  | 0.10%  | 0.02%  | 0.05%   | 7.87%  |
| A  | 0.09%  | 4.50%  | 75.81% | 9.19%  | 1.47%  | 0.47%  | 0.05%  | 0.09%   | 8.33%  |
| Baa                                      | 0.10%  | 0.56%  | 10.11% | 68.66% | 7.20%  | 2.15%  | 0.36%  | 0.57%   | 10.30% |
| Ba                                       | 0.03%  | 0.07%  | 1.08%  | 8.34%  | 56.19% | 12.12% | 1.18%  | 3.66%   | 17.34% |
| B  | 0.02%  | 0.09%  | 0.34%  | 1.08%  | 8.83%  | 55.35% | 4.45%  | 13.40%  | 16.45% |
| Caa-C                                    | 0.00%  | 0.00%  | 0.05%  | 2.28%  | 2.02%  | 8.24%  | 33.55% | 33.41%  | 20.46% |

| <b>THREE-YEAR Rating Transition Matrix</b> |        |        |        |        |        |        |        |         |        |
|--|--------|--------|--------|--------|--------|--------|--------|---------|--------|
|  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  | Default | WR     |
| Aaa  | 65.03% | 20.17% | 2.52%  | 0.00%  | 0.38%  | 0.00%  | 0.00%  | 0.00%   | 11.89% |
| Aa   | 1.82%  | 63.01% | 20.35% | 2.12%  | 0.50%  | 0.17%  | 0.02%  | 0.10%   | 11.90% |
| A  | 0.13%  | 5.79%  | 66.51% | 11.59% | 2.17%  | 0.65%  | 0.11%  | 0.26%   | 12.79% |
| Baa  | 0.13%  | 0.89%  | 13.01% | 58.59% | 7.84%  | 2.75%  | 0.56%  | 0.89%   | 15.34% |
| Ba   | 0.03%  | 0.09%  | 1.76%  | 9.80%  | 42.32% | 12.89% | 1.46%  | 6.21%   | 25.43% |
| B  | 0.04%  | 0.13%  | 0.35%  | 1.74%  | 8.87%  | 42.04% | 3.93%  | 18.29%  | 24.61% |
| Caa-C                                      | 0.00%  | 0.00%  | 0.10%  | 1.27%  | 3.33%  | 8.42%  | 21.89% | 37.30%  | 27.71% |

| <b>FOUR-YEAR Rating Transition Matrix</b> |        |        |        |        |        |        |        |         |        |
|---|--------|--------|--------|--------|--------|--------|--------|---------|--------|
|   | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  | Default | WR     |
| Aaa                                       | 56.15% | 23.77% | 3.85%  | 0.00%  | 0.27%  | 0.06%  | 0.00%  | 0.07%   | 15.82% |
| Aa  | 2.13%  | 54.36% | 23.09% | 3.20%  | 0.60%  | 0.28%  | 0.05%  | 0.23%   | 16.07% |
| A   | 0.14%  | 6.44%  | 59.22% | 13.09% | 2.70%  | 0.81%  | 0.14%  | 0.43%   | 17.02% |
| Baa                                       | 0.18%  | 1.04%  | 14.43% | 51.22% | 8.01%  | 3.07%  | 0.63%  | 1.39%   | 20.05% |
| Ba  | 0.03%  | 0.17%  | 2.05%  | 10.21% | 32.07% | 12.46% | 1.44%  | 8.65%   | 32.92% |
| B   | 0.06%  | 0.16%  | 0.49%  | 1.95%  | 8.17%  | 31.54% | 3.39%  | 21.80%  | 32.44% |
| Caa-C                                     | 0.00%  | 0.00%  | 0.00%  | 1.45%  | 3.40%  | 9.18%  | 12.61% | 40.42%  | 32.95% |

| <b>FIVE-YEAR Rating Transition Matrix</b> |        |        |        |        |        |        |       |         |        |
|---|--------|--------|--------|--------|--------|--------|-------|---------|--------|
|   | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C | Default | WR     |
| Aaa                                       | 48.06% | 26.18% | 4.98%  | 0.45%  | 0.06%  | 0.07%  | 0.13% | 0.19%   | 19.89% |
| Aa  | 2.26%  | 47.35% | 24.88% | 3.98%  | 0.83%  | 0.25%  | 0.03% | 0.36%   | 20.06% |
| A   | 0.14%  | 6.49%  | 53.63% | 13.86% | 3.11%  | 0.93%  | 0.16% | 0.57%   | 21.10% |
| Baa                                       | 0.25%  | 1.21%  | 14.75% | 45.86% | 7.82%  | 2.93%  | 0.55% | 1.83%   | 24.82% |
| Ba  | 0.03%  | 0.25%  | 2.22%  | 10.00% | 24.63% | 11.32% | 1.21% | 10.53%  | 39.79% |
| B   | 0.09%  | 0.15%  | 0.78%  | 1.70%  | 7.14%  | 23.66% | 2.86% | 24.34%  | 39.28% |
| Caa-C                                     | 0.00%  | 0.00%  | 0.00%  | 1.65%  | 3.46%  | 7.88%  | 7.70% | 41.75%  | 37.57% |

**Exhibit 38: Annual Rating Transition Matrices Conditional on Rating Changes Occurring to Different Tranches in the Same Deal, 1983-2002**

| <b>Conditional on another tranche being downgraded</b> |        |        |        |        |        |        |              |        |
|--|--------|--------|--------|--------|--------|--------|--------------|--------|
|  | TO:    |        |        |        |        |        |              |        |
| FROM:  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
| Aaa  | 64.86% | 28.11% | 4.10%  | 1.32%  | 0.15%  | 0.00%  | 0.88%        | 0.59%  |
| Aa   | 0.76%  | 55.84% | 31.49% | 8.77%  | 1.19%  | 0.43%  | 0.87%        | 0.65%  |
| A  | 0.19%  | 0.00%  | 47.96% | 35.87% | 10.22% | 1.30%  | 3.53%        | 0.93%  |
| Baa  | 0.00%  | 0.00%  | 0.14%  | 24.60% | 46.47% | 15.25% | 13.09%       | 0.43%  |
| Ba   | 0.00%  | 0.00%  | 0.00%  | 0.55%  | 15.62% | 30.68% | 51.78%       | 1.37%  |
| B  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 14.98% | 81.64%       | 3.38%  |
| Caa or below   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 84.62%       | 15.38% |

| <b>Conditional on another tranche being upgraded</b> |        |        |        |        |        |        |              |       |
|--|--------|--------|--------|--------|--------|--------|--------------|-------|
|  | TO:    |        |        |        |        |        |              |       |
| FROM:  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR    |
| Aaa  | 94.67% | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        | 5.33% |
| Aa   | 64.78% | 32.99% | 0.19%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        | 2.04% |
| A  | 18.32% | 44.27% | 35.57% | 0.15%  | 0.31%  | 0.00%  | 0.00%        | 1.37% |
| Baa  | 9.41%  | 11.51% | 39.75% | 37.45% | 1.05%  | 0.00%  | 0.21%        | 0.63% |
| Ba   | 1.98%  | 0.79%  | 10.67% | 54.55% | 30.04% | 0.79%  | 0.40%        | 0.79% |
| B  | 0.00%  | 1.37%  | 1.37%  | 10.96% | 20.55% | 61.64% | 4.11%        | 0.00% |
| Caa or below   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 11.11% | 22.22% | 66.67%       | 0.00% |

| <b>Conditional on another tranche sustaining no rating change</b> |        |        |        |        |        |        |              |       |
|---|--------|--------|--------|--------|--------|--------|--------------|-------|
|   | TO:    |        |        |        |        |        |              |       |
| FROM:   | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR    |
| Aaa   | 98.51% | 0.09%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        | 1.39% |
| Aa  | 2.82%  | 95.34% | 0.73%  | 0.18%  | 0.01%  | 0.00%  | 0.01%        | 0.90% |
| A   | 0.82%  | 1.52%  | 96.08% | 0.71%  | 0.11%  | 0.02%  | 0.04%        | 0.71% |
| Baa   | 0.26%  | 0.46%  | 1.66%  | 93.33% | 2.64%  | 0.71%  | 0.38%        | 0.55% |
| Ba  | 0.00%  | 0.06%  | 0.49%  | 3.21%  | 90.59% | 1.89%  | 3.15%        | 0.61% |
| B   | 0.00%  | 0.06%  | 0.06%  | 0.18%  | 0.66%  | 92.59% | 5.14%        | 1.32% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.17%  | 0.17%  | 94.23%       | 5.42% |

## Selected Moody's Special Comments on Structured Finance Rating Transitions

1. "A Historical Review of Rating Changes in the Public Asset-Backed Securities Market, 1986-1995", October 1995.
2. "Credit Shifts in Residential Mortgage Pass-Through Securities: A Rating Transition Study Update", May 1996.
3. "Rating Changes in the U.S. Asset-Backed Securities Market: First-Ever Transition Matrix Indicates Rating Stability... To Date", January 2001.
4. "Rating Changes in the U.S. Asset-Backed Securities Market: 2002 Second Half Update", January 2003.
5. "Rating Changes in the U.S. Asset-Backed Securities Market: 2001 Transition Matrix Update", January 2002.
6. "Credit Migration of CDO Notes, 1996-2001", February 2002.
7. "European Structured Finance Ratings Transitions and Matrix 1998-2001", May 2002.
8. "U.S. High-Yield CBOs: Analyzing the Performance of A Beleaguered CDO Category", January 2003

## Selected Moody's Special Comments on Corporate Issuer Default and Rating Transitions

1. "Default & Recovery Rates of Corporate Bond Issuers: A Statistical Review of Moody's Ratings Performance 1970-2001", February 2002.
2. "Moody's Rating Migration and Credit Quality Correlation, 1920-1996", July 1997.
3. "Understanding Moody's Corporate Bond Rating and Rating Process", May 2002

*To order reprints of this report (100 copies minimum), please call 1.212.553.1658.*

Report Number: 77291

---

### Authors

Jian Hu

---

### Senior Production Associate

Phillip Stone

© Copyright 2003, Moody's Investors Service, Inc. and/or its licensors including Moody's Assurance Company, Inc. (together, "MOODY'S"). All rights reserved. **ALL INFORMATION CONTAINED HEREIN IS PROTECTED BY COPYRIGHT LAW AND NONE OF SUCH INFORMATION MAY BE COPIED OR OTHERWISE REPRODUCED, REPACKAGED, FURTHER TRANSMITTED, TRANSFERRED, DISSEMINATED, REDISTRIBUTED OR RESOLD, OR STORED FOR SUBSEQUENT USE FOR ANY SUCH PURPOSE, IN WHOLE OR IN PART, IN ANY FORM OR MANNER OR BY ANY MEANS WHATSOEVER, BY ANY PERSON WITHOUT MOODY'S PRIOR WRITTEN CONSENT.** All information contained herein is obtained by MOODY'S from sources believed by it to be accurate and reliable. Because of the possibility of human or mechanical error as well as other factors, however, such information is provided "as is" without warranty of any kind and MOODY'S, in particular, makes no representation or warranty, express or implied, as to the accuracy, timeliness, completeness, merchantability or fitness for any particular purpose of any such information. Under no circumstances shall MOODY'S have any liability to any person or entity for (a) any loss or damage in whole or in part caused by, resulting from, or relating to, any error (negligent or otherwise) or other circumstance or contingency within or outside the control of MOODY'S or any of its directors, officers, employees or agents in connection with the procurement, collection, compilation, analysis, interpretation, communication, publication or delivery of any such information, or (b) any direct, indirect, special, consequential, compensatory or incidental damages whatsoever (including without limitation, lost profits), even if MOODY'S is advised in advance of the possibility of such damages, resulting from the use of or inability to use, any such information. The credit ratings, if any, constituting part of the information contained herein are, and must be construed solely as, statements of opinion and not statements of fact or recommendations to purchase, sell or hold any securities. **NO WARRANTY, EXPRESS OR IMPLIED, AS TO THE ACCURACY, TIMELINESS, COMPLETENESS, MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OF ANY SUCH RATING OR OTHER OPINION OR INFORMATION IS GIVEN OR MADE BY MOODY'S IN ANY FORM OR MANNER WHATSOEVER.** Each rating or other opinion must be weighed solely as one factor in any investment decision made by or on behalf of any user of the information contained herein, and each such user must accordingly make its own study and evaluation of each security and of each issuer and guarantor of, and each provider of credit support for, each security that it may consider purchasing, holding or selling. Pursuant to Section 17(b) of the Securities Act of 1933, MOODY'S hereby discloses that most issuers of debt securities (including corporate and municipal bonds, debentures, notes and commercial paper) and preferred stock rated by MOODY'S have, prior to assignment of any rating, agreed to pay to MOODY'S for appraisal and rating services rendered by it fees ranging from \$1,500 to \$1,500,000.



**Contact**

**Phone**

**New York**

Jian Hu  
Richard Cantor  
Joseph Snailer  
Pamela Dent  
Danielle Nazarian  
Lindsay Douglas

1.212.553.1653

## **Structured Finance Rating Transitions: 1983-2003**

### *Ratings Remain Volatile in 2003 but Downgrade-to-Upgrade Ratio Falls Sharply*

#### **Summary Opinion**

*Moody's annual Structured Finance Ratings Transition Study examines rating transitions in global structured finance going back to 1983. The report summarizes the historical experience, and compares these to those of corporate ratings. This study provides an update to the more comprehensive special comment, "Global Structured Finance Rating Transitions: 1983-2002," which was published in January 2003.*

Key 2003 findings include:

#### **TRENDS IN DOWNGRADE AND UPGRADE RATES**

- The downgrade rate in 2003 was unchanged at 7.2%, from the previous year, and the upgrade rate rose to 3.2%, up from 1.5%. The overall downgrade-to-upgrade ratio dropped from 5:1 in 2002 to 2:1 in 2003.
- The downgrade rate, when weighted by the number of total notches downgraded per year, decreased to 30.2% from 33.9% in 2002. As a comparison, in the corporate sector, the weighted-downgrade rate receded to 15.3% from 21.5%.

#### **TRENDS IN RATING STABILITY**

- About 90% of all structured ratings were unchanged in 2003. This compares favorably to the long-term historical average (1983-2003) of 92.3% in structured finance and 76.6% in corporate finance.

#### **TRENDS IN THE MAGNITUDE OF RATING CHANGES**

- The average number of total notches changed per year for each downgraded security fell to 4.2 in 2003 from 4.7 in 2002, while for each upgraded security the average number fell to 2.6 from 3.2. In the corporate sector, the average was 1.7 for each downgraded security and 1.3 for each upgraded security in 2003.
- The rate of transition into Caa or below by rating category in 2003 was on average higher in structured finance than in corporate finance.



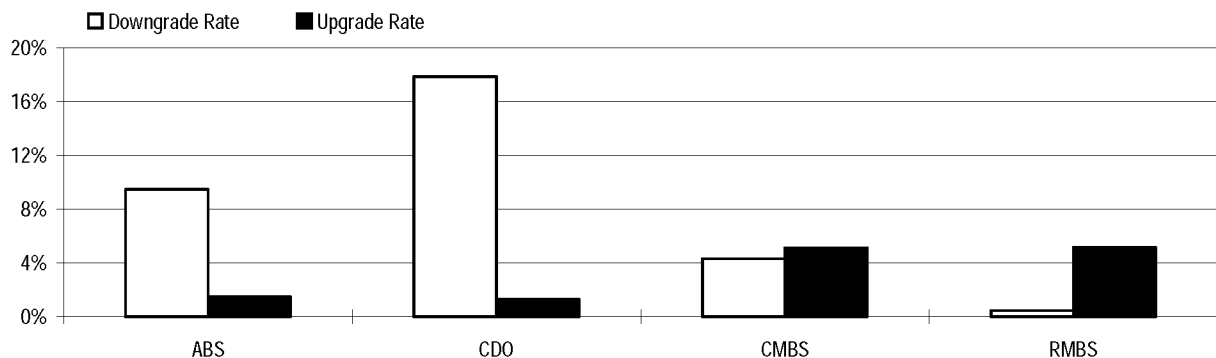
## RATING TRANSITION TRENDS BY SECTOR

- Overall ABS sustained more rating transitions than last year, with the rate of downgrades rising to 9.5% from 7.1% in 2002. Driving the increase were the continuing troubles in the manufactured housing loan, franchise loan, equipment lease sectors, and rating actions taken against tobacco settlement bonds. However, ABS ratings continued to show strong performance in asset classes backed by consumer credit, such as auto loans, credit card receivables, and in particular, home equity loans.
- The rate of downgrades in the troubled CDO sector slowed, dropping to 17.9% from 25.1% in 2002; however, the average downgrade rate in CDOs was still substantially higher than in other structured securities.
- The CMBS sector improved, with more upgrades than downgrades in 2003. The downgrade rate decreased to 4.3% from 5.3% in 2002, while the upgrade rate increased to 5.1% from 2.4%.
- The RMBS sector continued to show outstanding performance thanks to strong housing economics and record-setting prepayment incentives. The upgrade rate ran up to 5.1% from 1.7%, while the downgrade rate inched up to 0.5% from 0.1%.

## RATING TRANSITION TRENDS BY REGION

- Credit strength in the U.S. improved. The downgrade rate stayed the same in the U.S. at 7%, but the upgrade rate rose to 3.2% from 1.1%.
- In Europe, the downgrade rate edged up to 10.2% from 9.3%, but the average number of total notches downgraded per year declined to 2.6 from 3.3. The bulk of downgrades were limited to the CDO sector, which accounted for approximately 84% of Europe's downgrades.
- The Asia Pacific region saw improving trends in downgrades in 2003, as the rate of downgrades fell to 2.3% from 3.4% in 2002. The upgrade rate, however, also fell to 3% from 4.5% reinforcing rating stability in this region.

**Figure 1 – 2003 Downgrade and Upgrade Rates by Sector**



---

---

# Table of Contents

---

|   | Page |
|---|------|
| Summary Opinion .....   | 1    |
| Overview .....  | 4    |
| Data Sample Criteria .....  | 4    |
| Data Sample Findings .....  | 4    |
| Rating Transitions in the All Structured Finance Category .....                 | 6    |
| Comparing Structured Rating Transitions with Corporate Rating Transitions ..... | 10   |
| Sector Specific Analysis of Rating Transitions .....                            | 13   |
| ABS .....   | 13   |
| CDOs .....  | 19   |
| CMBS .....  | 24   |
| RMBS .....  | 27   |
| Regional Comparisons of Rating Transitions .....                                | 31   |
| European and U.S. Rating Transition Rates .....                                 | 31   |
| Asia Pacific and U.S. Rating Transition Rates .....                             | 33   |
| Rating Transitions in the Derivatives Sector .....                              | 34   |
| Appendix I: Terminology .....   | 37   |
| Appendix II: Transition Matrices .....  | 39   |
| Related Research .....  | 51   |

## Overview

---

Structured finance ratings remained volatile in 2003. Despite the volatility, we are nonetheless beginning to see signs of improved performance going forward.

Out of a total universe of 18,947 ratings at the beginning of 2003, the global structured finance sector downgraded 1,279 ratings from 570 deals and upgraded 569 ratings from 216 deals, resulting in a 2:1 downgrade-to-upgrade ratio. In comparison, out of 14,345 ratings in 2002, 958 ratings from 420 deals were downgraded and 194 ratings from 102 deals were upgraded, resulting in a 5:1 downgrade-to-upgrade ratio.

The frequency of rating downgrades (on the basis of alpha-numeric ratings at the beginning and the end of a year) remained about the same at 7.2%, while the frequency of rating upgrades climbed to 3.2% in 2003 from 1.5% in 2002, signaling an overall improvement of credit quality among global structured finance securities.<sup>1</sup>

Of all the securities downgraded in 2003, 48.2% were asset-backed securities (ABS), 39.4% were collateralized debt obligations (CDOs), 10.4% were commercial mortgage-backed securities (CMBS), and 2% were residential mortgage-backed securities (RMBS).

Of all the securities upgraded in 2003, 17.2% were ABS, 6.5% were CDOs, 27.8% were CMBS, and 48.5% were RMBS.

## Data Sample Criteria

---

The data sample for this study uses the same set of criteria adopted in Moody's first global structured rating transition study published in January 2003.<sup>2</sup> The sample in this study now covers 1983 to 2003.

The current data sample contains a total of 30,278 structured securities from 10,720 deals in ABS, CDOs, CMBS, and RMBS over the entire sample period from 1983 to 2003. Only structured securities with long-term bond ratings were included. Tranches wrapped by financial guarantors, government agencies, or government sponsored enterprises (GSEs) were excluded.

Tranches carrying the same rating from the same deal were collapsed into a single rating tranche with two exceptions: Where two or more tranches shared the same rating in the same deal, but were collateralized by distinct groups of loan pools, we did not collapse the tranches. In addition, we did not collapse interest-only (IO) or residual tranches even though they have the same rating in the same deal.

To better reflect rating transition performance in the structured finance universe and to reduce direct corporate influence on structured rating transition statistics we made two adjustments: First, we excluded deals that were entirely dependent on a single corporate rating, such as the single borrower credit tenant lease (CTL) deals as per our first global transition study.

Second, we segregated the derivatives sector from the four major structured finance sectors. The derivatives sector contains mainly repackaged securities, structured notes, and credit derivatives. We analyze this sector on a stand-alone basis because most of the repackaged securities, and structured notes, are heavily dependent or based on one corporate rating, such as the rating of a swap counterparty or a single reference credit. In our first study, derivatives were included in the "OTHERS" sector.

The four major sectors – ABS, CDO, CMBS, and RMBS – combined, with the exclusion of derivatives, is the main focus of this study. We refer to these sectors as "all structured finance" (or "structured finance as a whole") in this paper. Rating transition statistics in the derivatives sector appear in the final section.

## Data Sample Findings

---

Figure 2 reports the number of rated securities outstanding on January 1, 2004 by broad rating group, sector, and region. As indicated, global structured securities were once again predominantly rated investment-grade with the Aaa-rated securities making up more than one third of the entire sample.<sup>3</sup>

---

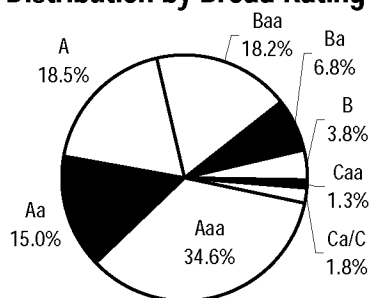
1. Unless noted, downgrade rate and upgrade rate are generally not weighted by the magnitude of a rating change and capture changes within as well as across the broad letter rating categories. For more on terminology, please see Appendix I.

2. "Structured Finance Rating Transitions: 1983-2002, Comparisons with Corporate Ratings and Across Sectors", Moody's Special Comment, January 2003.

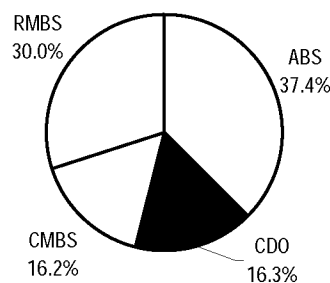
3. Without collapsing tranches with the same rating in the same deal, the number and percent of Aaa rated securities will be even higher.

**Figure 2 – Distributions of Number of Rated Securities on 1/1/2004**

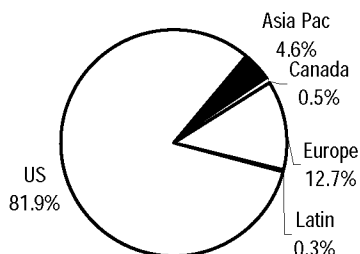
**Distribution by Broad Rating**



**Distribution by Sector**



**Distribution by Region**



By sector, the number of outstanding ABS securities included in the data sample grew by 33.3% from the beginning of 2003 to the beginning of 2004, driven by an impressive growth rate of 64.3% in home equity loan (HEL) asset class.<sup>4</sup> At the beginning of 2004, the share of HEL in the ABS sector reached 45.7%. As a result, the share of ABS in all structured finance was 37.4%, the highest among the four sectors.

In RMBS, the growth was equally remarkable in 2003 with a rating growth rate of 27.5%, making RMBS the second largest sector with a 30% share of the total at the beginning of 2004, and the largest if HEL is not included in the ABS sector.

Rated securities in the CDO and CMBS sectors also recorded significant growth in 2003 with a growth rate of 36.5% for CDOs and 20.8% for CMBS. The shares of CDOs and CMBS as a percentage of all outstanding structured securities remained about the same at the beginning of 2004 as 2003.

By the number of deals, the share of ABS at the beginning of 2004 stood at 42.3%, while the shares of RMBS, CDO, and CMBS were 29.9%, 20.2%, and 7.6%, respectively.

<sup>4</sup> The growth rate reported here represents the growth in the number of outstanding securities from the beginning to the end of a calendar year. These growth rates are different from growth rates in issuance volume or the size of the market.

By region, rated structured securities in Europe and the Asia Pacific also saw extraordinary growth. European structured securities grew at a rate of 43.3% in 2003, while Asia Pacific structured securities grew by 36.5% from the beginning to the end of 2003.

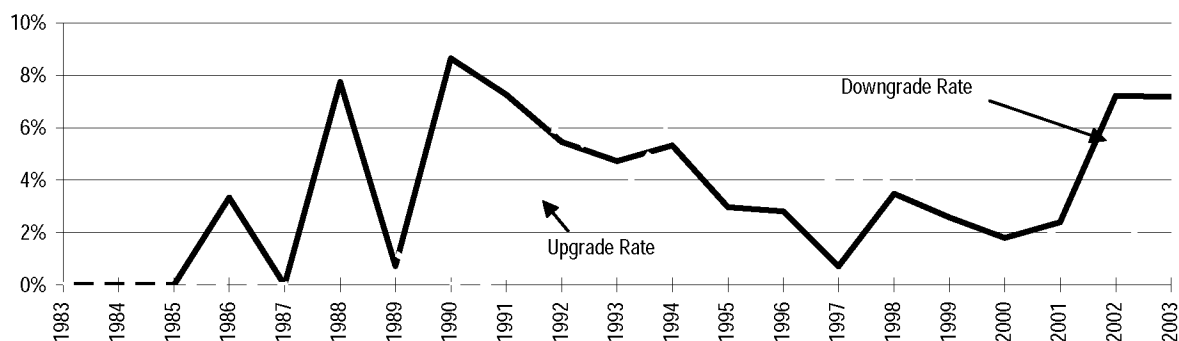
## Rating Transitions in the All Structured Finance Category

In this section we analyze rating transitions across all structured finance securities in the ABS, CDO, CMBS, and RMBS sectors. Rating transitions in each of the four sectors and in the derivatives sector are presented later in this report.

### UPGRADE RATES INCREASE, BUT DOWNGRADE RATES REMAIN UNCHANGED

World-wide, the downgrade rate in structured finance remained unchanged relative to the year prior at 7.2%. The upgrade rate was higher during the year at 3.2%, compared to 1.5% in 2002.<sup>5</sup> Historically, 2002 and 2003 experienced substantially higher downgrade rates and lower upgrade rates than any recent periods prior to 2002. Figure 3 presents the downgrade and upgrade rates from 1983 to 2003.

**Figure 3 – Downgrade and Upgrade Rates in the All Structured Finance Category**



### DOWNGRADES LESS SEVERE

We measure the severity of rating changes by the number of notches changed. The average number of notches changed per downgrade *action* increased to 3.5 in 2003, from 3.1 in 2002. However, the number of rating actions per downgraded security over the year declined. Because fewer securities sustained downgrades, the average number of total notches downgraded decreased to 4.2 in 2003 from 4.7 in 2002.<sup>6</sup>

In the meantime, the average number of notches changed per upgrade *action* fell from 3.1 to 2.6 and the average number of total notches upgraded per year also fell from 3.2 to 2.6.

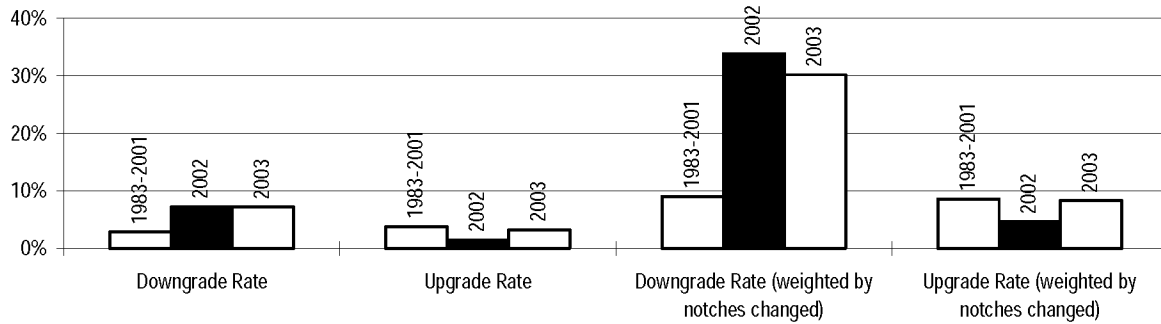
### OVERALL CREDIT TREND SHOWS SIGNS OF IMPROVEMENT, BUT HIGH RATING VOLATILITY REMAINS

Weighted by the magnitude of downgrades, the downgrade rate declined to 30.2% in 2003, from 33.9% in 2002. However, the downgrade rates in 2003 and 2002 were both substantially higher than the historical average of 9.0% during 1983-2001 (Figure 4).

5. The downgrade (upgrade) rate is the number of securities downgraded (upgraded) during a year divided by the total number of securities outstanding at the beginning of the year. Only ratings at the beginning and the end of the year are used. Securities whose rating was withdrawn during the year were excluded from both the denominator and the numerator of these rates.

6. The term "rating action" refers to a Moody's rating change made at a specific time. The term "notch" refers to the number of rating levels by which a rating moves. A single rating action can incorporate more than one notches. A specific security may undergo more than one rating action in a year.

**Figure 4 – Average Downgrade and Upgrade Rates in the All Structured Finance Category**



Furthermore, we calculated the difference between the weighted-upgrade rate and the weighted-downgrade rate – this is the rating drift measure – and the sum of the weighted-downgrade rate and weighted-upgrade rate – this is the rating volatility measure.

The rating drift in 2003 was negative at -21.9%, significantly higher than the historical average of -0.5% during 1983-2001, despite a seven-percentage-point improvement over 2002. Meanwhile, the downgrade-to-upgrade ratio dropped to 2:1 from 5:1 in 2002 (Figure 5).

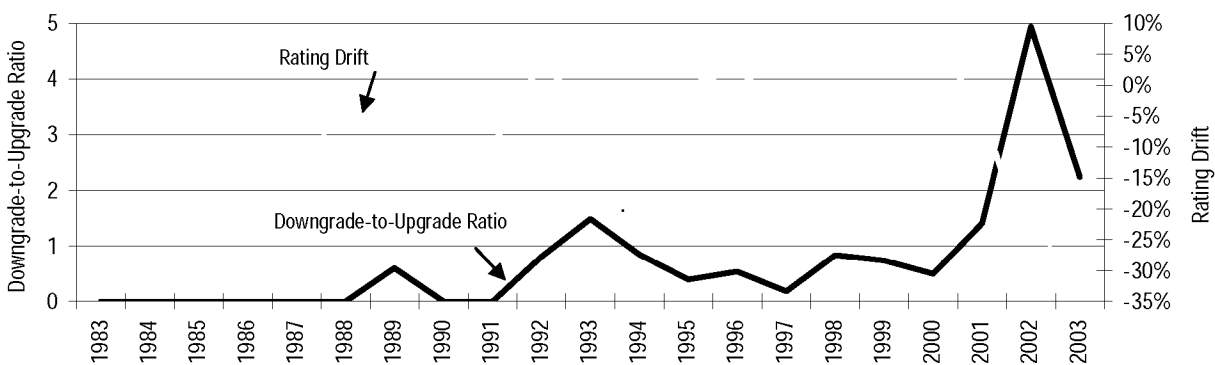
Ratings continued to be volatile in 2003 in the all structured finance category. Overall rating volatility stood at 38.5% in 2003, the same as in 2002, which was the highest level historically. In comparison, the historical average rating volatility during 1983-2001 was 17.5%.

Meanwhile, the frequency of ratings that remain unchanged in 2003 (also called the rating stability rate) stood at about 89.6%, slightly lower than 91.3% in 2002, and an average of 93.4% during 1983-2001.

### **DOWNGRADE MOMENTUM PERSISTS**

Of all the 2003 downgrades, 32% sustained a downgrade in 2002, while of all the 2003 upgrades, only 2% had experienced an upgrade in 2002. This suggests that in 2003 the downgrade momentum persisted and was stronger than the upgrade momentum.<sup>7</sup>

**Figure 5 – Rating Drift and Downgrade-to-Upgrade Ratio in the All Structured Finance Category**



### **AAA-RATED SECURITIES ARE THE MOST STABLE**

The one-year rating transition matrix (Figure 6) provides downgrade and upgrade rates by rating category by reviewing rating changes at the beginning and the end of a year. Figure 6 compares the 2003 one-year rating transition matrix with an average matrix during 1983-2003.

7. Structured finance rating transition momentum was first examined in the same first structured finance transition study.

**Figure 6 – One-Year Rating Transition Matrices in the All Structured Finance Category<sup>8</sup>**

| 2003 only<br>Rating from: | Rating to: |        |        |        |        |        |              |
|---------------------------|------------|--------|--------|--------|--------|--------|--------------|
|                           | Aaa        | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa                       | 98.21%     | 1.06%  | 0.50%  | 0.20%  | 0.03%  |        |              |
| Aa                        | 5.02%      | 89.13% | 3.43%  | 1.58%  | 0.60%  | 0.19%  | 0.04%        |
| A                         | 0.65%      | 3.22%  | 89.62% | 3.75%  | 1.57%  | 0.95%  | 0.24%        |
| Baa                       | 0.31%      | 0.28%  | 2.83%  | 88.20% | 3.68%  | 2.49%  | 2.20%        |
| Ba                        | 0.07%      | 0.07%  | 0.22%  | 3.26%  | 83.20% | 4.74%  | 8.44%        |
| B                         | 0.28%      |        |        | 0.98%  | 3.66%  | 81.01% | 14.06%       |
| Caa or below              |            |        |        |        |        | 0.21%  | 99.79%       |

| 1983-2003 average<br>Rating from: | Rating to: |        |        |        |        |        |              |
|-----------------------------------|------------|--------|--------|--------|--------|--------|--------------|
|                                   | Aaa        | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa                               | 98.86%     | 0.82%  | 0.20%  | 0.07%  | 0.01%  | 0.01%  | 0.04%        |
| Aa                                | 5.48%      | 91.15% | 2.25%  | 0.77%  | 0.19%  | 0.09%  | 0.08%        |
| A                                 | 1.03%      | 2.42%  | 93.14% | 2.20%  | 0.72%  | 0.29%  | 0.20%        |
| Baa                               | 0.44%      | 0.50%  | 2.20%  | 90.34% | 3.65%  | 1.57%  | 1.31%        |
| Ba                                | 0.12%      | 0.06%  | 0.64%  | 3.56%  | 85.92% | 3.62%  | 6.09%        |
| B                                 | 0.07%      |        | 0.07%  | 0.67%  | 1.52%  | 87.16% | 10.51%       |
| Caa or below                      |            |        |        |        | 0.09%  | 0.26%  | 99.65%       |

On the basis of broad rating categories, Figure 6 reveals that rating stability rates were about the same as the long-term average since 1983. Rating stability rates stayed above 80%, and above 88% for the investment-grade rating categories, with the Aaa rating remaining the most stable.

#### **FEWER RATINGS FALL INTO THE CAA OR BELOW CATEGORY, BUT RATES REMAIN ABOVE AVERAGE**

Significantly, Figure 6 also shows that the annual rate of downgrades into the Caa or below category was generally higher in 2003 than for the weighted average period from 1983-2003. However, while 2003 evidenced a higher than normal downgrade rate into the Caa or below category, it was nonetheless an improvement when compared to 2002 (Figure 7). Specifically, the rate of downgrades into the Caa or below category from a Baa rating was about the same in 2003 relative to 2002, but was significantly lower for securities rated Aaa, Aa, and A (Figure 7).

**Figure 7 – Rates of Downgrades into the Caa or Below Category in the All Structured Finance Sector**

| Rating at the Beginning of a Year | 2003   | 2002   | 1983-2001 |
|-----------------------------------|--------|--------|-----------|
| Aaa                               |        | 0.15%  | 0.02%     |
| Aa                                | 0.04%  | 0.55%  | 0.02%     |
| A                                 | 0.24%  | 0.43%  | 0.12%     |
| Baa                               | 2.20%  | 2.25%  | 0.61%     |
| Ba                                | 8.44%  | 12.39% | 2.72%     |
| B                                 | 14.06% | 15.10% | 7.32%     |

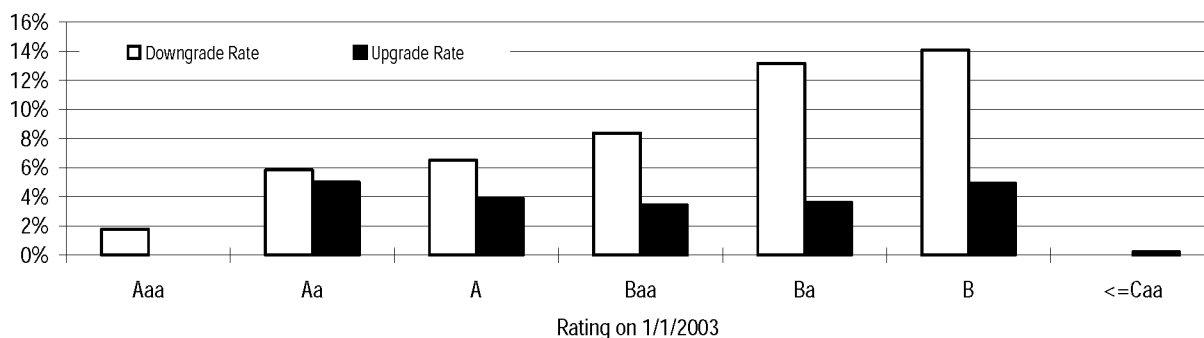
#### **HIGHER RATINGS SUSTAIN FEWER DOWNGRADES**

In general, higher ratings on average have been more stable. When they do change, they are less likely to be downgraded, and more likely to be upgraded. Figure 8 summarizes one-year downgrade rates and upgrade rates by broad rating category.

<sup>8</sup> Empty cells in all the figures reported in this study indicate zero values.



**Figure 8 – 2003 Downgrade Rates and Upgrade Rates by Rating in the All Structured Finance Sectors**



### AAA-RATED SECURITIES ALSO STABLE OVER LONGER HORIZONS

Figure 9 shows two transition matrices – one for the two-year horizon and one for the five-year horizon. Other multi-year rating transition matrices appear in Appendix II.

**Figure 9 – Two-Year and Five-Year Rating Transition Matrices in the All Structured Finance Sector (1983-2003)**

| Two-Year<br>Rating From: | Rating To: |        |        |        |        |        |              |
|--------------------------|------------|--------|--------|--------|--------|--------|--------------|
|                          | Aaa        | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa                      | 97.84%     | 1.41%  | 0.38%  | 0.17%  | 0.04%  | 0.03%  | 0.12%        |
| Aa                       | 11.39%     | 82.46% | 3.57%  | 1.53%  | 0.52%  | 0.26%  | 0.27%        |
| A                        | 2.66%      | 4.61%  | 87.40% | 2.74%  | 1.29%  | 0.54%  | 0.75%        |
| Baa                      | 1.10%      | 1.18%  | 4.22%  | 82.07% | 4.85%  | 2.62%  | 3.95%        |
| Ba                       | 0.30%      | 0.22%  | 1.61%  | 4.78%  | 76.44% | 4.31%  | 12.34%       |
| B                        | 0.05%      |        | 0.16%  | 1.33%  | 1.65%  | 81.32% | 15.49%       |
| Caa or below             |            |        |        |        | 0.32%  | 0.64%  | 99.04%       |

| Five-Year<br>Rating From: | Rating To: |        |        |        |        |        |              |
|---------------------------|------------|--------|--------|--------|--------|--------|--------------|
|                           | Aaa        | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa                       | 96.59%     | 2.01%  | 0.64%  | 0.25%  | 0.02%  | 0.06%  | 0.43%        |
| Aa                        | 32.94%     | 56.88% | 5.09%  | 2.41%  | 0.87%  | 0.72%  | 1.10%        |
| A                         | 11.25%     | 11.98% | 69.98% | 2.70%  | 1.48%  | 0.73%  | 1.89%        |
| Baa                       | 4.04%      | 3.70%  | 11.37% | 62.10% | 4.78%  | 3.20%  | 10.81%       |
| Ba                        | 1.51%      | 1.68%  | 6.88%  | 14.35% | 57.80% | 2.94%  | 14.85%       |
| B                         | 0.35%      |        | 0.52%  | 5.05%  | 3.31%  | 68.29% | 22.47%       |
| Caa or below              |            |        |        |        | 2.76%  | 2.07%  | 95.17%       |

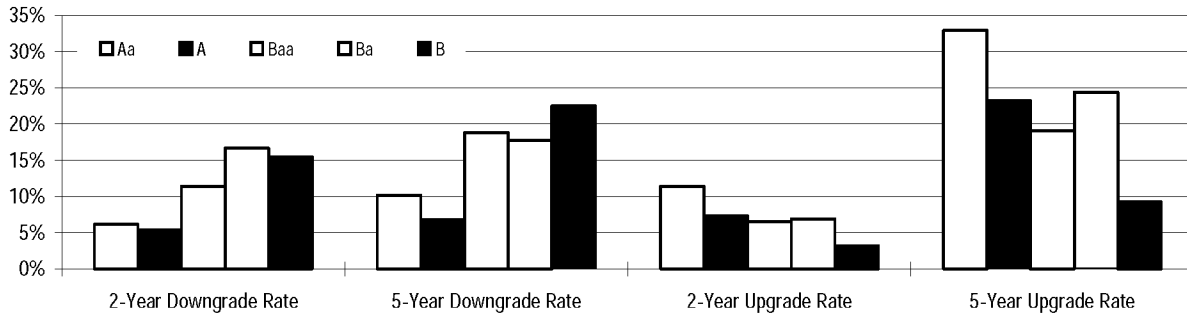
As indicated by the data in Figure 9, ratings were generally stable across multi-year horizons. Securities rated Aaa have experienced an average rating stability rate of 97.8% over a two-year horizon, and 96.6% over a five-year horizon, only slightly lower than the rating stability rate of 98.9% over the one-year horizon.

In addition, over the five-year horizon, the Aa and Ba ratings were on average the least stable, but they sustained higher rates of upgrades over the five-year horizons.

### UPGRADES MORE FREQUENT OVER LONGER HORIZONS

In contrast, rating stability rates of lower rating categories have declined more significantly over longer horizons. Overall, the increase in the downgrade rate from the two-year to the five-year horizon has been less significant than the increase in the upgrade rate (figure 10). This result was largely attributable to the seasoning patterns of rating changes first illustrated in the first global structured finance rating transition study.

**Figure 10 – Two-Year and Five-Year Downgrade and Upgrade Rates in the All Structured Finance Category (1983-2003)**



## Comparing Structured Rating Transitions with Corporate Rating Transitions

### CORPORATE RATINGS SHOW IMPROVED STABILITY, BUT REMAIN MUCH LESS STABLE THAN STRUCTURED

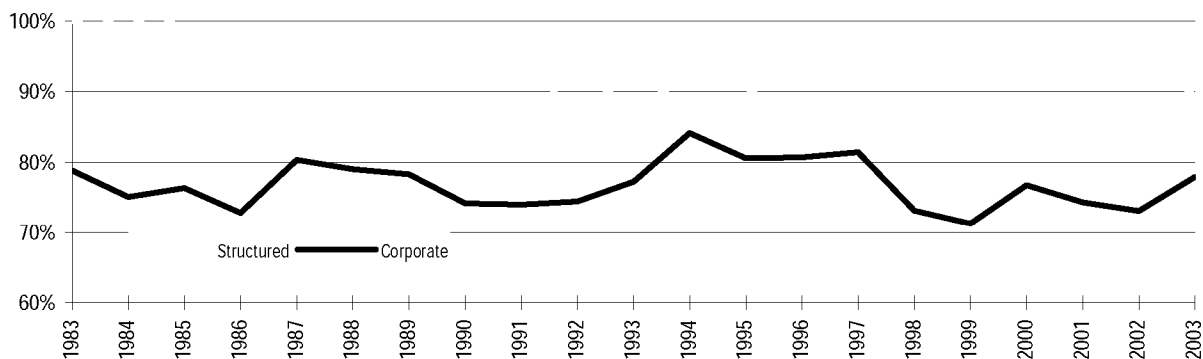
Global corporate ratings<sup>9</sup> were more stable in 2003 than in 2002, as the one-year stability rate rose to 77.9% from 73.1% in 2002.

Out of a total universe of 4,692 ratings, 717 ratings were downgraded and 319 ratings were upgraded, as compared to 986 downgrades and 250 upgrades out of a total universe of 4,591 ratings in 2002. The one-year downgrade rate (unweighted by the magnitude of downgrades and includes defaults as downgrades) fell to 15.3% in 2003, from 21.5% in 2002, while the upgrade rate went to 6.8%, from 5.5%.

Despite the improvement, corporate ratings were less stable than those in the all structured finance category. Overall, rating stability in structured finance was more than 10 percentage points higher than in corporate finance in 2003, as it has been since 1983.

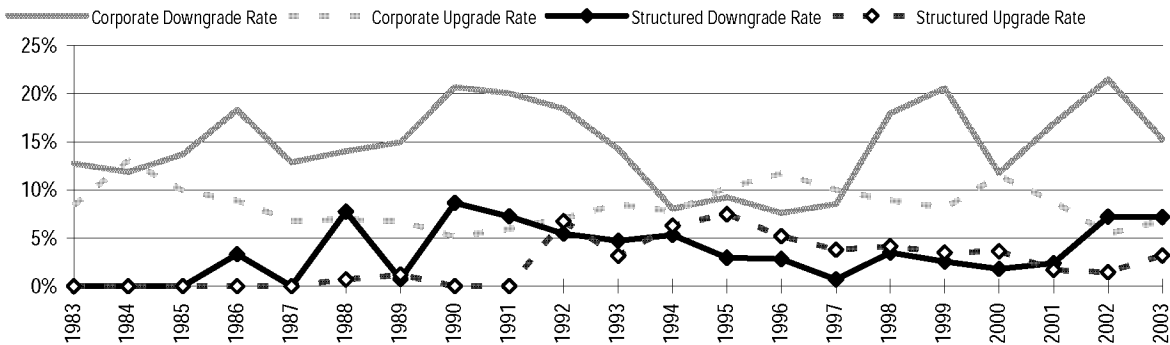
Figure 11 and 12 detail rating stability trends and transition rates since 1983 in the structured and corporate sectors.

**Figure 11 – Rating Stability Rates in the Structured and Corporate Sectors**



9. Includes sovereign but excludes municipal ratings.

**Figure 12 – Downgrade and Upgrade Rates in the Structured and Corporate Sectors**



In Figure 13 we present a more detailed comparison between the two sectors through one-year rating transition matrices.

By broad rating category, we can see that corporate and structured rating stability rates in 2003 were similar, but the overall downgrade rates for the Aaa and Baa rating categories were higher in structured than in corporate, but lower for the Aa and A rating categories. Furthermore, in 2003, there were more upgrades in the Aa, A, and Baa rating categories in structured than in corporate, but more upgrades in the Ba and B categories in corporate than in structured.

**Figure 13 – One-Year Rating Transition Matrices in the Structured and Corporate Sectors for 2003**

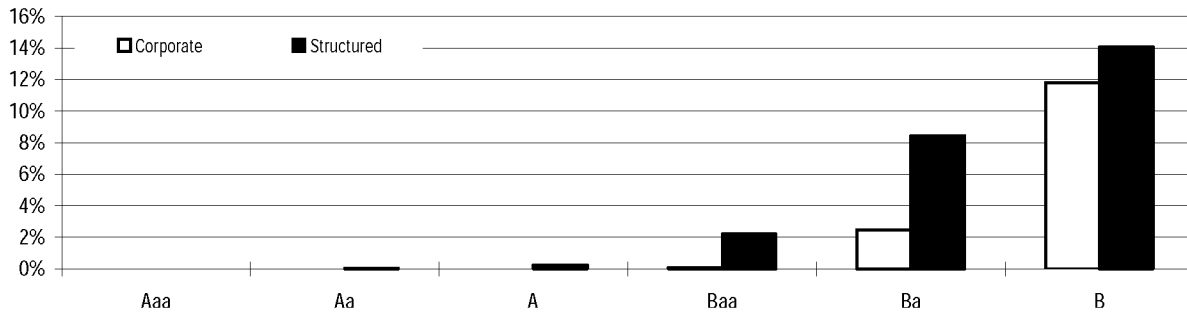
| Global Corporate in 2003<br>Rating from: | Rating to: |        |        |        |        |        |              |
|--|------------|--------|--------|--------|--------|--------|--------------|
|  | Aaa        | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa                                      | 99.44%     |        |        |        | 0.56%  |        |              |
| Aa                                       | 1.44%      | 91.79% | 6.77%  |        |        |        |              |
| A  | 0.08%      | 1.28%  | 90.91% | 7.58%  | 0.08%  | 0.08%  |              |
| Baa                                      |            |        | 1.79%  | 90.89% | 5.45%  | 1.79%  | 0.09%        |
| Ba                                       |            |        | 0.38%  | 4.19%  | 82.29% | 10.67% | 2.48%        |
| B  |            |        |        | 0.29%  | 4.03%  | 83.88% | 11.80%       |
| Caa or below                             |            |        |        |        |        | 6.67%  | 93.33%       |

| Global Structured in 2003<br>Rating from: | Rating to: |        |        |        |        |        |              |
|---|------------|--------|--------|--------|--------|--------|--------------|
|   | Aaa        | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa                                       | 98.21%     | 1.06%  | 0.50%  | 0.20%  | 0.03%  |        |              |
| Aa  | 5.02%      | 89.13% | 3.43%  | 1.58%  | 0.60%  | 0.19%  | 0.04%        |
| A   | 0.65%      | 3.22%  | 89.62% | 3.75%  | 1.57%  | 0.95%  | 0.24%        |
| Baa                                       | 0.31%      | 0.28%  | 2.83%  | 88.20% | 3.68%  | 2.49%  | 2.20%        |
| Ba  | 0.07%      | 0.07%  | 0.22%  | 3.26%  | 83.20% | 4.74%  | 8.44%        |
| B   | 0.28%      |        |        | 0.98%  | 3.66%  | 81.01% | 14.06%       |
| Caa or below                              |            |        |        |        |        | 0.21%  | 99.79%       |

**CORPORATES DEMONSTRATE LOWER RATES OF DOWNGRADES INTO THE CAA OR BELOW CATEGORY**

Additionally, the rates of downgrades into the Caa or below category by rating were higher in structured than in corporate, and were particularly so among securities rated investment-grade at the beginning of 2003. The findings are reported in Figure 14.

**Figure 14 – Rates of Downgrades into the Caa or Below Category in the Corporate and Structured Sectors for 2003**



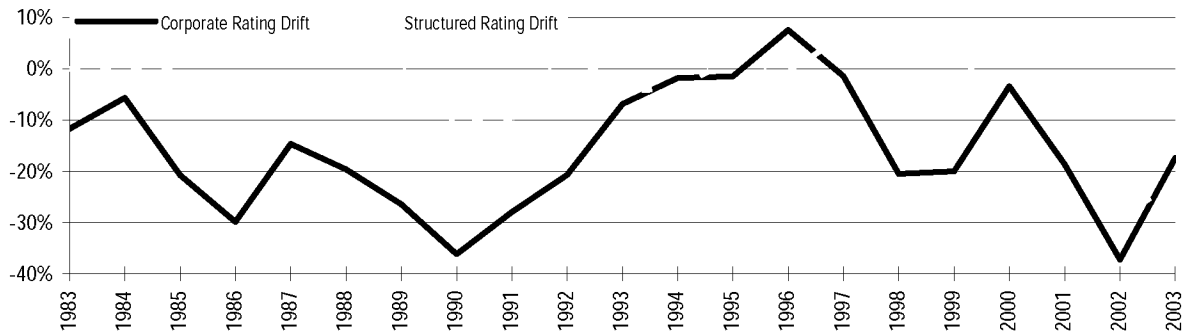
**RATING DRIFT TRENDED SIMILARLY IN RECENT YEARS**

Similar to the structured sector, corporate issuers also demonstrated slower negative rating drift in 2003. Negative rating drift fell to -17.4%, from -37.2% in 2002. Per our discussion above, negative drift in the structured sector fell to -21.9% from -29.2%.

As indicated in Figure 15, the structured and corporate sectors displayed strong similarity with respect to their rating drifts in the last five years, suggesting a positive correlation between the two sectors during this period.

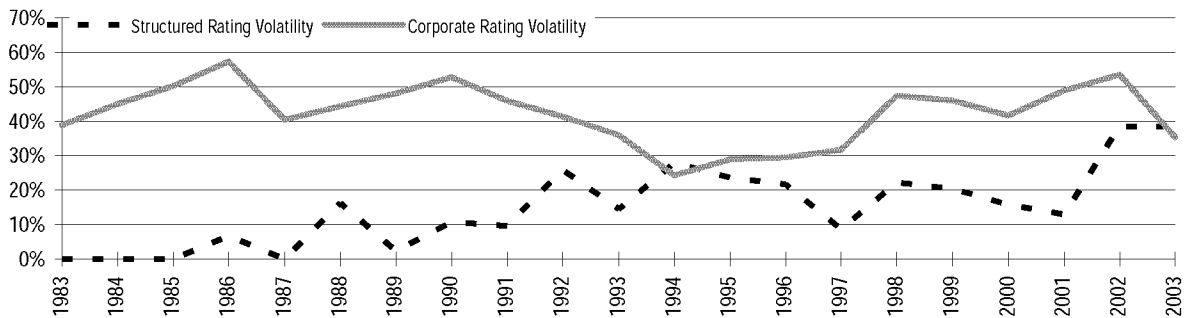
Despite the similarity and correlation, the average rating drift from 1983-2001 was significantly different across the two sectors, with the average rating drift among structured securities only at -0.5%, and the drift among corporate issuers at -13.7%.

**Figure 15 - Rating Drift in the Structured and Corporate Sectors**



In contrast, the corporate rating volatility declined to 35.3% in 2003 from 53.5% in 2002, while the structured rating volatility stayed at the same level at 38.5% (Figure 16).

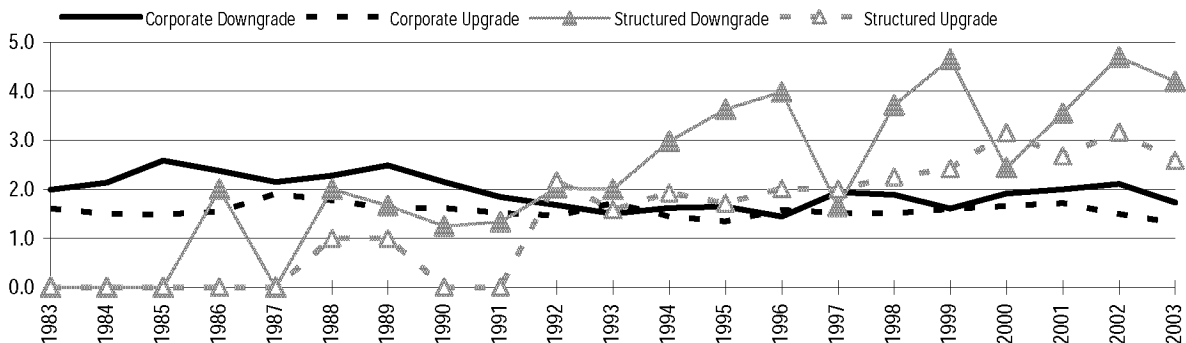
**Figure 16 – Rating Volatility in the Structured and Corporate Sectors**



**DOWNGRADES IN CORPORATE LESS SEVERE**

The average number of total notches downgraded per year in corporate fell to 1.7 in 2003 from 2.1 in 2002. Total notches upgraded fell to 1.3 from 1.5. The number of total notches downgraded and upgraded in corporate were both significantly lower than those in structured, which were 4.2 for downgrades and 2.6 for upgrades in 2003. Figure 17 illustrates the differences.

**Figure 17 – Average Number of Notches Downgraded and Upgraded per Year in the Structured and Corporate Sectors**



**Sector Specific Analysis of Rating Transitions**

**ABS**

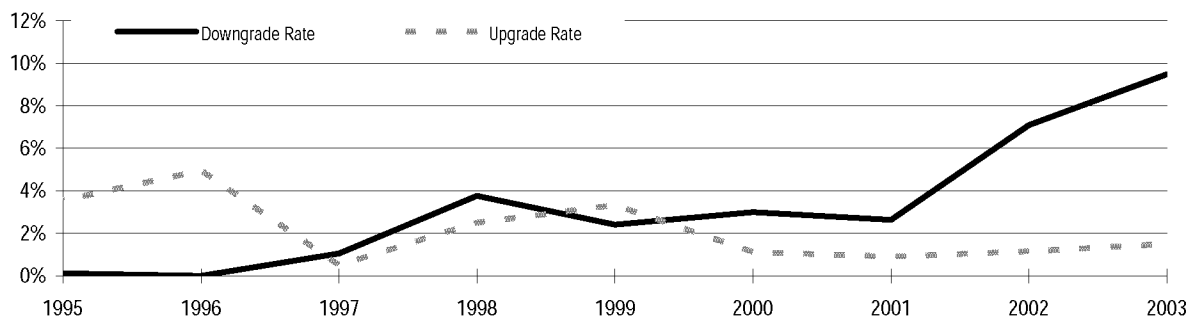
**Downgrade and Upgrade Rates**

Out of a total universe of 6,905 ABS ratings at the beginning of 2003, 616 ratings from 243 deals were downgraded and 98 ratings from 52 deals were upgraded in 2003. Of the 616 downgrades, three were from the Asia Pacific region, 15 were from Europe, nine were from Latin America, and 589 were from the U.S.

Of the 98 upgrades, 15 were from the Asia Pacific region, four from Europe, one from Latin America, and 78 were from the U.S. By the number of deals, about 9% were affected by downgrades and 2% were affected by upgrades.

As in 2002, the downgrade rate in 2003 greatly exceeded the upgrade rate with a downgrade rate of 9.5%, and an upgrade rate of 1.5%. Figure 18 depicts the patterns of downgrade and upgrade rates in ABS from 1995 to 2003.

**Figure 18 – Downgrade and Upgrade Rates in ABS**



Within the ABS sector, transactions backed by franchise loans, manufactured housing loans, leases, and tobacco settlement bonds were most affected by downgrades. ABS securities backed by traditional consumer credit such as auto loans, credit card receivables, and home equity loans continued to perform well. Figure 19 takes a closer look at the downgrade rate and the upgrade rate for a few selected asset classes within the ABS sector.

**Figure 19 – Rates of Downgrades and Upgrades in 2003 and 2002 for Selected ABS**

|                                 | Number of Outstanding Ratings |          | Downgrade Rate |        | Upgrade Rate |       |
|---------------------------------|-------------------------------|----------|----------------|--------|--------------|-------|
|                                 | 1/1/2003                      | 1/1/2002 | 2003           | 2002   | 2003         | 2002  |
| <b>Autos</b>                    | 499                           | 395      | 1.85%          |        | 3.70%        | 4.55% |
| <b>Credit Cards</b>             | 1073                          | 939      | 1.77%          | 3.48%  | 0.73%        | 0.12% |
| <b>Franchise Loans</b>          | 157                           | 150      | 40.76%         | 44.00% |              |       |
| <b>HEL</b>                      | 2558                          | 1615     | 3.09%          | 0.70%  | 2.06%        | 1.33% |
| <b>Leases</b>                   | 468                           | 424      | 22.00%         | 11.02% | 1.00%        | 0.28% |
| <b>MH</b>                       | 656                           | 594      | 39.72%         | 23.49% | 0.77%        | 0.17% |
| <b>Small Business Loans</b>     | 117                           | 108      | 9.48%          |        |              |       |
| <b>Tobacco Settlement Bonds</b> | 52                            | 31       | 100%           |        |              |       |

As indicated, securities backed by manufactured housing (MH) or franchise loans continued to deteriorate in 2003. In 2003, Moody's downgraded more than 250 tranches from 81 MH deals, most of which were associated with a large number of Green Tree/Conseco transactions, although deals issued by Oakwood Mortgage Investors (OMI) and UCFC Funding also contributed to the total.

The downgrades associated with Green Tree/Conseco had a particularly strong impact on rating transitions in the ABS sector as a whole. Excluding all Green Tree/Conseco deals, the ABS sector sustained a 7.2% downgrade rate in 2003, about 2.3 percentage points lower than the 9.5% downgrade rate in ABS as a whole. In 2002, the ABS downgrade rate without Green Tree/Conseco was only 4.8%, compared to 7.2% in ABS as a whole.

By excluding Green Tree/Conseco from ABS we also saw significantly lower rating drift of -31% and rating volatility 40.9%, compared to drift of -45.5% and volatility of 55.2% in ABS as a whole that were reported above.

Eighty-eight securities backed by 11 equipment leases deals, represented by DVI Receivables transactions, and 14 aircraft leases deals were also downgraded in 2003, doubling the downgrade rate in the leases class of ABS to 22% in 2003 from 11% in 2002. Additional downgrades in tobacco settlement bonds, securities backed by small business loans, and the HEL asset class further exacerbated the ABS downgrade rate.

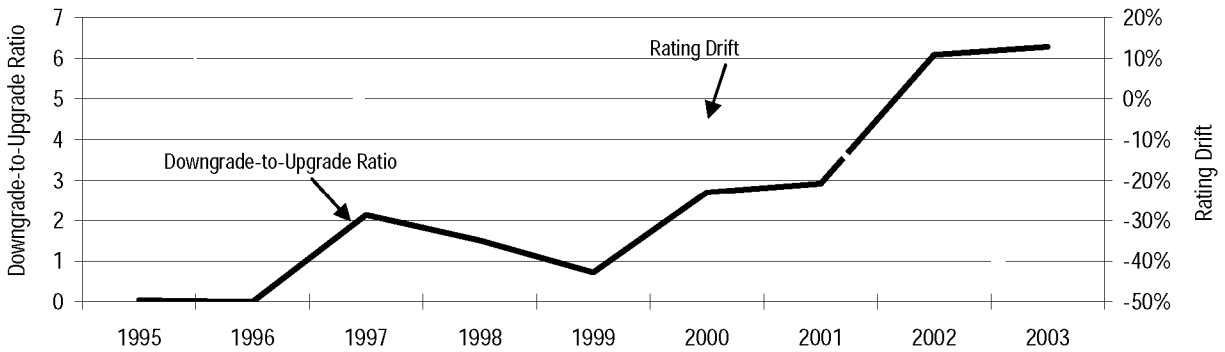
The auto and credit card asset classes in ABS, however, continued to outperform. Both sustained a downgrade rate lower than 2% in 2003. In addition, auto ABS sustained a 3.7% upgrade rate in 2003, again showing the strength in this segment.

More than 20% of the 2003 ABS downgrades came from the 2000 vintage, while the 1999, 2000, and 2001 vintages together added up to more than 50% of the total ABS downgrades in 2003.

### Rating Drift and Rating Volatility

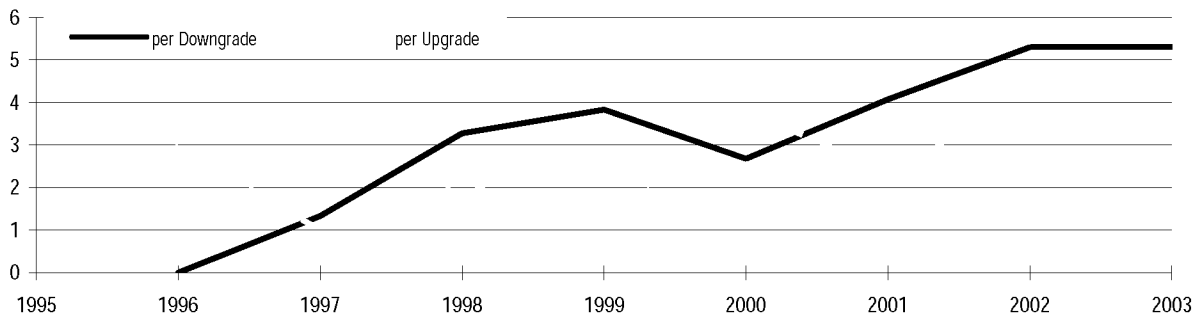
The negative rating drift in ABS reached -45.5% in 2003, while the downgrade-to-upgrade ratio remained high at 6:1. Meanwhile, rating volatility increased to 55.2% in 2003 from 42.2% in 2002. Figure 20 shows the trend of rating drift and downgrade-to-upgrade ratio.

**Figure 20 – Rating Drift and Downgrade-to-Upgrade Ratio in ABS**



Moreover, the average number of notches downgraded per year remained high at 5.3 in 2003, matching the 2002 level, while the average number of notches upgraded per year declined from 3.9 in 2002, to 3.2 in 2003. In addition, the average number of notches changed per downgrade *action* rose to 4.5 in 2003, from 4.0 in 2002; while for upgrade *action* the number declined to 3.3 in 2003, from 3.7 in 2002 (Figure 21).

**Figure 21 – Average Number of Notches Downgraded and Upgraded per Year in ABS**



### One-Year Rating Transition Matrices

Figure 22 compares the ABS rating transition matrix in 2003 with the average from 1983 to 2003. It shows that the rating stability rates by rating in 2003 were all lower than their long-term averages. Nonetheless, the stability rates of investment-grade ratings remained above 85%, with the Aaa rating being the most stable.

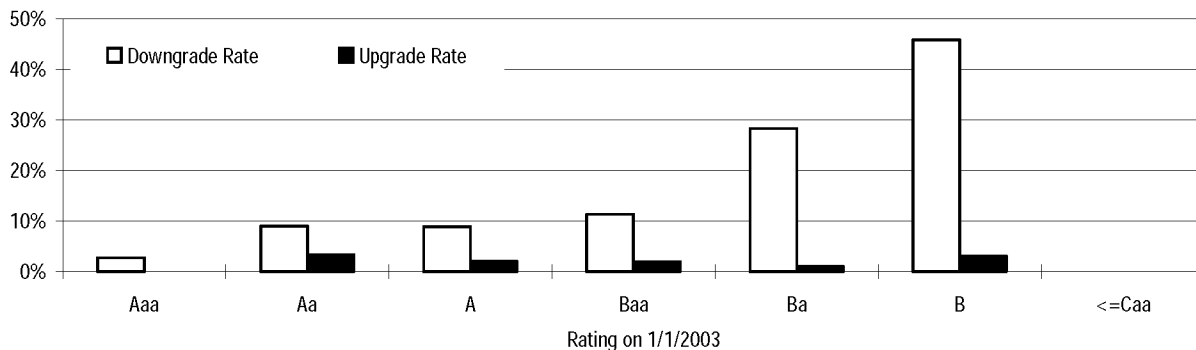
**Figure 22 – One-Year Rating Transition Matrices in ABS**

| 2003<br>Rating from: | Rating to: |        |        |        |        |        |              |
|----------------------|------------|--------|--------|--------|--------|--------|--------------|
|                      | Aaa        | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa                  | 97.30%     | 1.21%  | 0.94%  | 0.45%  | 0.09%  |        |              |
| Aa                   | 3.35%      | 87.66% | 4.08%  | 2.93%  | 1.57%  | 0.42%  |              |
| A                    | 0.79%      | 1.22%  | 89.10% | 4.81%  | 2.01%  | 1.71%  | 0.37%        |
| Baa                  | 0.71%      | 0.09%  | 1.15%  | 86.74% | 2.83%  | 3.80%  | 4.69%        |
| Ba                   | 0.34%      |        |        | 0.69%  | 70.69% | 5.17%  | 23.10%       |
| B                    |            |        |        |        | 3.13%  | 51.04% | 45.83%       |
| Caa or below         |            |        |        |        |        |        | 100.00%      |

| 1983-2003 average<br>Rating from: | Rating to: |        |        |        |        |        |              |
|-----------------------------------|------------|--------|--------|--------|--------|--------|--------------|
|                                   | Aaa        | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa                               | 98.71%     | 0.85%  | 0.24%  | 0.10%  | 0.02%  | 0.01%  | 0.08%        |
| Aa                                | 2.59%      | 93.22% | 2.22%  | 1.17%  | 0.42%  | 0.10%  | 0.27%        |
| A                                 | 0.71%      | 1.01%  | 94.93% | 1.89%  | 0.87%  | 0.42%  | 0.16%        |
| Baa                               | 0.55%      | 0.31%  | 0.87%  | 89.78% | 4.81%  | 1.92%  | 1.76%        |
| Ba                                | 0.26%      | 0.17%  | 0.34%  | 4.74%  | 76.21% | 5.09%  | 13.19%       |
| B                                 |            |        | 0.30%  | 0.60%  | 0.90%  | 73.19% | 25.00%       |
| Caa or below                      |            |        |        |        |        |        | 100.00%      |

Additionally, Figure 22 and 23 show that the downgrade rates of speculative-grade ABS were much higher than those of investment-grade ABS. The rates of downgrades into the Caa or below rating category from the Ba and B categories were particularly high.

**Figure 23 – Downgrade Rates and Upgrade Rates by Rating in ABS in 2003**



Furthermore, no ABS securities rated Aaa and Aa at the beginning of 2003 were downgraded into the Caa or below category in 2003. However, securities rated A or below at the beginning of the year did sustain higher than average Caa-transition rates (Figure 24).

Transitions into the Caa category also worsened relative to 2002, particularly in the Baa and B categories. We attribute this trend to the troubles in the MH loan, franchise loan, and aircraft and equipment lease sectors, as well as the rapid deterioration in a small number of HEL transactions.



**Figure 24 – Rates of Downgrades into the Caa or Below Category in ABS**

| Rating at the Beginning of a Year | 2003   | 2002   | 1983-2001 |
|-----------------------------------|--------|--------|-----------|
| Aaa                               |        | 0.40%  | 0.03%     |
| Aa                                |        | 1.36%  | 0.04%     |
| A                                 | 0.37%  | 0.30%  | 0.04%     |
| Baa                               | 4.69%  | 1.76%  | 0.27%     |
| Ba                                | 23.10% | 26.12% | 3.52%     |
| B                                 | 45.83% | 25.00% | 13.37%    |

***Multi-Year Rating Transition Matrices***

In Figure 25, we provide a two-year and a five-year rating transition matrix for the ABS sector. The matrix reveals that multi-year rating stability rates have generally been much lower over longer horizons. Furthermore, over longer horizons, there have been more upgrades than downgrades in the Aa and A rating categories, but more downgrades than upgrades in the Baa and below rating categories.

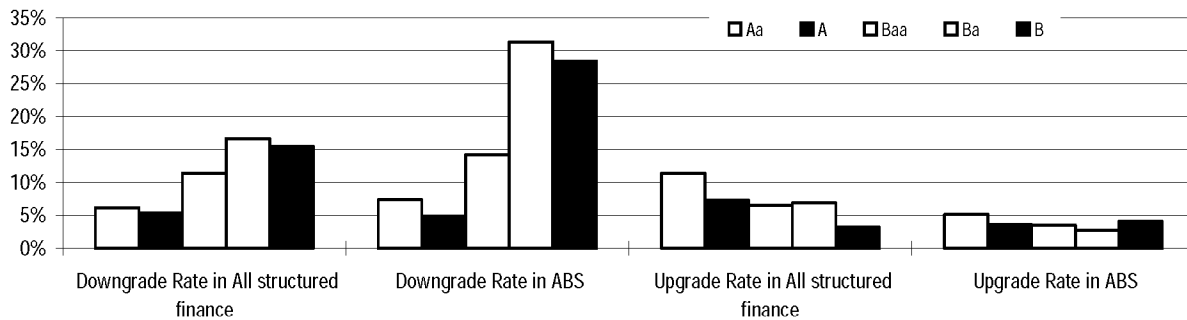
**Figure 25 – Two-Year and Five-Year Rating Transition Matrices in ABS (1983-2003)**

| Two-Year<br>Rating From: | Rating To: |        |        |        |        |        |              |
|--------------------------|------------|--------|--------|--------|--------|--------|--------------|
|                          | Aaa        | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa                      | 97.65%     | 1.52%  | 0.34%  | 0.19%  | 0.08%  | 0.06%  | 0.15%        |
| Aa                       | 5.17%      | 87.43% | 3.33%  | 1.73%  | 0.99%  | 0.64%  | 0.71%        |
| A                        | 1.69%      | 1.96%  | 91.48% | 2.37%  | 1.07%  | 0.63%  | 0.80%        |
| Baa                      | 1.32%      | 0.66%  | 1.56%  | 82.22% | 7.21%  | 2.84%  | 4.19%        |
| Ba                       | 0.60%      | 0.48%  | 0.84%  | 0.84%  | 65.90% | 5.78%  | 25.54%       |
| B                        | 0.45%      |        | 0.90%  | 1.35%  | 1.35%  | 67.57% | 28.38%       |
| Caa or below             |            |        |        |        |        |        | 100.00%      |

| Five-Year<br>Rating From: | Rating To: |        |        |        |        |        |              |
|---------------------------|------------|--------|--------|--------|--------|--------|--------------|
|                           | Aaa        | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa                       | 96.67%     | 2.11%  | 0.67%  | 0.39%  | 0.06%  |        | 0.11%        |
| Aa                        | 16.41%     | 73.48% | 4.28%  | 1.66%  | 1.19%  | 2.62%  | 0.36%        |
| A                         | 5.13%      | 3.71%  | 86.39% | 1.50%  | 1.35%  | 0.43%  | 1.50%        |
| Baa                       | 2.69%      | 1.95%  | 2.08%  | 63.00% | 12.21% | 4.88%  | 13.19%       |
| Ba                        | 2.86%      | 1.90%  | 1.90%  | 3.81%  | 49.05% | 3.33%  | 37.14%       |
| B                         | 4.44%      |        | 4.44%  | 6.67%  | 4.44%  | 60.00% | 20.00%       |
| Caa or below              |            |        |        |        |        |        | 100.00%      |

Compared with structured finance as a whole, ABS sustained higher multi-year downgrade rates and lower multi-year upgrade rates. However, higher rated securities have generally sustained lower downgrade rates and higher upgrade rates (Figure 26).

**Figure 26 – Average Two-Year Downgrade and Upgrade Rates for ABS and the All Structured Finance Category (1983-2003)**



**Rating Transitions in the HEL Asset Class<sup>10</sup>**

The number of ABS securities backed by Home Equity Loans (HEL) has grown explosively in the past several years. At the beginning of 2001, there were only 1,103 HEL ratings in our sample. By the end of 2003, the number of HEL ratings more than tripled to 4,204. The majority of HEL assets were subprime first-lien mortgages, whose growth were fueled in recent years by record low interest rates and strong housing markets.

While we continue to classify HEL as part of the ABS, its sheer size, growth potential, and popularity warrants some individual discussion. In Figure 27 we present the one-year transition matrix in 2003 and a weighted-average rating transition matrix from 1990 to 2003.

**Figure 27 – One-Year Rating Transition Matrices for HEL**

| 2003<br>Rating from: | Rating to: |        |        |        |        |        |              |
|----------------------|------------|--------|--------|--------|--------|--------|--------------|
|                      | Aaa        | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa                  | 99.60%     | 0.40%  |        |        |        |        |              |
| Aa                   | 3.58%      | 94.63% | 1.79%  |        |        |        |              |
| A                    | 0.58%      | 2.69%  | 94.24% | 2.11%  | 0.19%  | 0.19%  |              |
| Baa                  | 0.17%      |        | 1.82%  | 92.87% | 1.49%  | 1.16%  | 2.49%        |
| Ba                   |            |        |        | 1.94%  | 87.38% |        | 10.68%       |
| B                    |            |        |        |        | 9.68%  | 70.97% | 19.35%       |
| Caa or below         |            |        |        |        |        |        | 100.00%      |

| 1990-2003 average<br>Rating from: | Rating to: |        |        |        |        |        |              |
|-----------------------------------|------------|--------|--------|--------|--------|--------|--------------|
|                                   | Aaa        | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa                               | 99.82%     | 0.18%  |        |        |        |        |              |
| Aa                                | 2.03%      | 97.29% | 0.68%  |        |        |        |              |
| A                                 | 0.50%      | 1.56%  | 96.31% | 1.06%  | 0.50%  | 0.06%  |              |
| Baa                               | 0.13%      | 0.19%  | 1.02%  | 93.96% | 2.92%  | 0.64%  | 1.14%        |
| Ba                                |            | 0.25%  | 0.74%  | 4.21%  | 87.13% | 1.24%  | 6.44%        |
| B                                 |            |        | 0.63%  | 1.25%  | 1.88%  | 88.75% | 7.50%        |
| Caa or below                      |            |        |        |        |        |        | 100.00%      |

Compared to rating transition rates shown in Figure 22 for all ABS securities, HEL transition rates demonstrated outstanding performance both in 2003 and on average from 1990 to 2003. Rating stability rates in HEL were much higher than in ABS as a whole. In particular, rating stability rates of investment-grade rating categories were well above 90%.

The stability rates of the Ba and B rating categories in HEL were about 20 percentage points higher than those in ABS as a whole. Long-term average rating stability rates from 1990 to 2003 were even higher in the HEL sector.

<sup>10</sup> This includes securities collateralized by subprime (B&C) mortgage loans, home improvements loans, high loan-to-value loans, home equity lines of credit, closed-end second lien loans and net interest margin (NIM) securitizations. It does not include "Alt-A" mortgages, which are part of RMBS.

Moreover, no HEL securities rated Aaa, Aa, or A at the beginning of a year were downgraded into the Caa or below category during the year. However, in 2003, there was some deterioration in the rates of downgrades from Baa and below into the Caa category, which can be observed in the last column of Figure 27.

Over multi-year horizons, ratings in the HEL sector have also been stable and experienced fewer downgrades and more upgrades than in the ABS sector as a whole. Figure 28 provides two multi-year rating transition matrices – one over a two-year horizon and the other over a five-year horizon.

**Figure 28 – Two-Year and Five-Year Rating Transition Matrices for HEL (1990-2003)**

| Two-Year<br>Rating From: | Rating To: |        |        |        |        |        |              |
|--------------------------|------------|--------|--------|--------|--------|--------|--------------|
|                          | Aaa        | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa                      | 99.63%     | 0.37%  |        |        |        |        |              |
| Aa                       | 4.14%      | 94.70% | 1.17%  |        |        |        |              |
| A                        | 1.14%      | 3.04%  | 92.10% | 2.47%  | 1.05%  | 0.10%  | 0.10%        |
| Baa                      | 0.31%      | 0.52%  | 1.77%  | 88.05% | 5.93%  | 1.46%  | 1.98%        |
| Ba                       | 0.34%      | 0.68%  | 1.69%  | 0.68%  | 80.00% | 3.05%  | 13.56%       |
| B                        | 0.81%      |        | 1.63%  | 2.44%  | 2.44%  | 81.30% | 11.38%       |
| Caa or below             |            |        |        |        |        |        | 100.00%      |

| Five-Year<br>Rating From: | Rating To: |        |        |        |        |        |              |
|---------------------------|------------|--------|--------|--------|--------|--------|--------------|
|                           | Aaa        | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa                       | 99.66%     | 0.34%  |        |        |        |        |              |
| Aa                        | 12.44%     | 84.46% | 2.59%  | 0.52%  |        |        |              |
| A                         | 5.81%      | 7.75%  | 75.19% | 4.26%  | 3.49%  | 1.55%  | 1.94%        |
| Baa                       | 1.84%      | 2.30%  | 4.61%  | 61.29% | 15.21% | 5.99%  | 8.76%        |
| Ba                        | 2.53%      | 2.53%  | 5.06%  | 1.27%  | 63.29% | 3.80%  | 21.52%       |
| B                         | 5.56%      |        | 5.56%  | 8.33%  | 5.56%  | 58.33% | 16.67%       |
| Caa or below              |            |        |        |        |        |        |              |

## CDOs

### *Downgrade and Upgrade Rates*

The CDO sector showed significant improvements in 2003, although the sector still remained under stress after an extreme volatile 2002. The downgrade rate dropped to 17.9% in 2003 from 25.1% in 2002, and the upgrade rate rose from 0.6% to 1.3%. Despite improvement, the CDO downgrade rate was still the highest in the structured finance universe.

Out of a total universe of 2,946 ratings, 504 ratings from 258 transactions were downgraded. Of the 504 downgrades, three (or 0.6%) were from the Asia Pacific region, 178 (or 35.3%) were from Europe, and 323 (or 64.1%) were from the U.S.

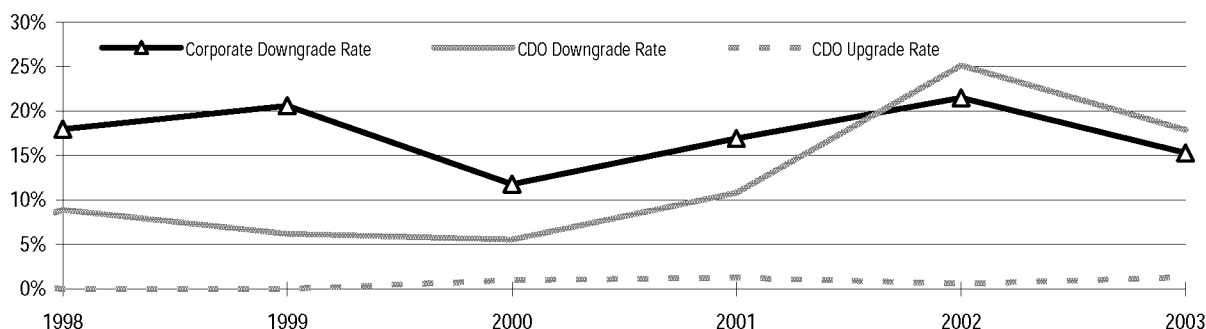
A total of 37 ratings from 21 deals were upgraded. Of the 37 upgrades, 18 (or 48.6%) were from Europe, and 19 (or 51.4%) were from the U.S.

The one-year downgrade rate, weighted by the number of total notches changed per year, dropped from a record high 123.4% in 2002 to 58.9% in 2003, cutting the 2002 level by more than a half. However, the weighted downgrade rate in 2003 was still substantially higher than the historical average level of 21.0% during 1991-2001, marking 2002 and 2003 as two extremely stressful years since the inception of the CDO sector.

Relative to the downgrade rate, the upgrade rate in CDOs has been particularly low and was 1.3% in 2003 (Figure 29). Figure 29 illustrates the trends in the CDO migration rates from 1998 to 2003.

For comparison, Figure 29 also includes the downgrade rates in the corporate sector. It points out a strong and positive correlation between the corporate and CDO downgrade rates.

**Figure 29 – Downgrade and Upgrade Rates in CDOs and Corporate Downgrade Rates**



Within the CDO sector, declines in the downgrade rate were evident in both synthetic and cash-flow transactions (Figure 30).

The downgrade rate for balance sheet synthetic securities fell to 16.2% in 2003, from 30.5% in 2002. Among synthetic arbitrage securities, the downgrade rate fell to 33.7% from 61.1%, although a main cause of such a huge decline in downgrade rate for this asset class could also be attributed to the large increase in the number of rated securities. For ACF CBO securities, the downgrade rate in 2003 was 15.4 percentage points lower than in 2002.

**Figure 30 – Downgrade and Upgrade Rates in 2002 and 2003 for Selected CDOs <sup>11</sup>**

|               | Number of Outstanding Ratings |          | Downgrade Rate |        | Upgrade Rate |       |
|---------------|-------------------------------|----------|----------------|--------|--------------|-------|
|               | 1/1/2003                      | 1/1/2002 | 2003           | 2002   | 2003         | 2002  |
| ACF CBO       | 543                           | 538      | 33.46%         | 48.86% | 0.56%        | 0.19% |
| ACF CLO       | 494                           | 331      | 5.47%          | 7.27%  |              |       |
| BalSh CF      | 123                           | 135      | 3.81%          | 1.89%  | 8.57%        | 0.94% |
| BalSh Syn     | 284                           | 209      | 16.21%         | 30.53% | 1.98%        | 1.05% |
| IG CBO        | 141                           | 109      | 29.93%         | 20.18% | 0.73%        |       |
| Resecuritized | 372                           | 200      | 8.92%          | 4.52%  | 0.54%        |       |
| Syn Arb       | 472                           | 126      | 33.71%         | 61.06% | 0.89%        |       |

Although few CDOs were upgraded, balance sheet cash flow CDOs posted an upgrade rate of 8.57% in 2003. This is attributable to nine upgrades in two European balance sheet cash flow deals.

About 40% of the downgraded CDO securities in 2003 had experienced a downgrade in 2002, exhibiting strong downgrade momentum in the CDO sector.

In addition, the majority of the 2003 CDO downgrades were from the most recent vintages. In fact, 74% of them were from three vintages: 2000, 2001, and 2002. The 2000 vintage experienced 136 downgrades – the highest among all vintages.

### ***Rating Drift and Rating Volatility***

CDO rating drift and rating volatility staged a big turn-around in 2003. The negative rating drift slowed dramatically and the downgrade-to-upgrade ratio dropped from an all time high 43:1 in 2002 to 14:1 in 2003. However, the weighted downgrade rate and the rating drift in 2003 were still about three times as high as the averages during 1991-2001 (Figure 31).

11. Note:

ACF CBO – arbitrage cash flow collateralized bond obligations;

ACF CLO – arbitrage cash flow collateralized loan obligations;

BalSh CF – balance sheet cash flow deals;

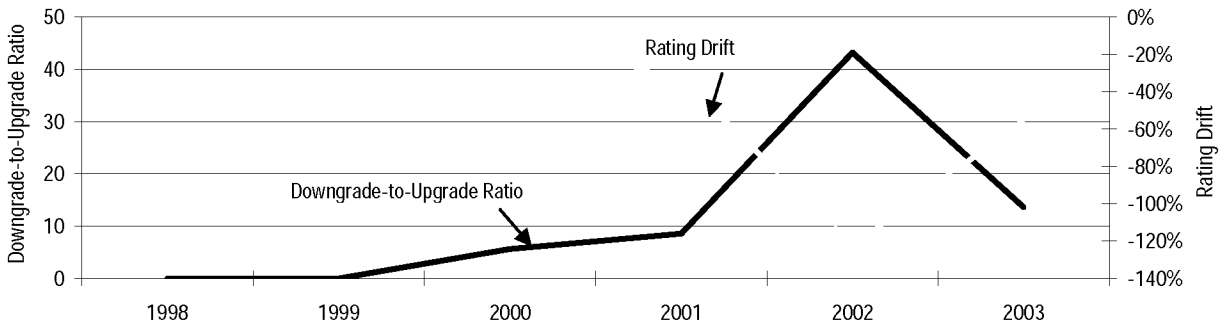
BalSh Syn – balance sheet synthetic deals;

IG CBO – investment-grade collateralized bond obligations;

Resecuritized – including cash flow resecuritizations and synthetic resecuritizations;

Syn Arb – synthetic arbitrage deals including both managed and static.

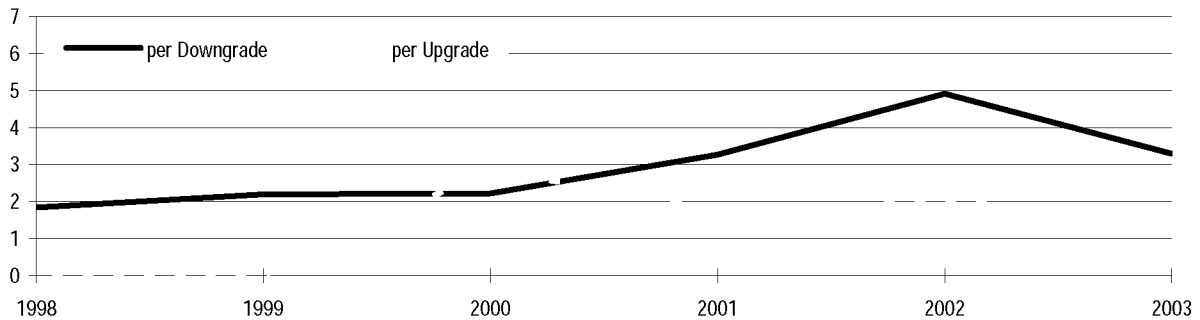
**Figure 31 – Rating Drift and Downgrade-to-Upgrade Ratio in CDOs**



In the meantime, the average number of total notches downgraded per year fell to 3.3 in 2003, from 4.9 in 2002, while the average number of total notches upgraded per year rose to 2.4 from 2.

Furthermore, the number of notches changed per downgrade *action* decreased slightly from 2.7 in 2002 to 2.6 in 2003, while notches per upgrade action rose slightly to 2.2 from 2.0 (Figure 32).

**Figure 32 – Average Number of Notches Downgraded and Upgraded per Year in CDOs**



Despite improvement in the downgrade rate in the CDO sector, the average CDO downgrade rate was still the highest among all structured securities, and was about twice the downgrade rate in ABS. However, after weighting downgrades by the number of notches downgraded per year, the ABS downgrade rate came closer to the CDO downgrade rate, owing to the greater magnitude of downgrades in ABS in 2003.

***One-Year Rating Transition Matrices***

Figure 33 compares two one-year rating transition matrices in the CDO sector: one for 2003 only and one for an average from 1991 to 2003.

**Figure 33 – One-Year Rating Transition Matrices in CDOs**

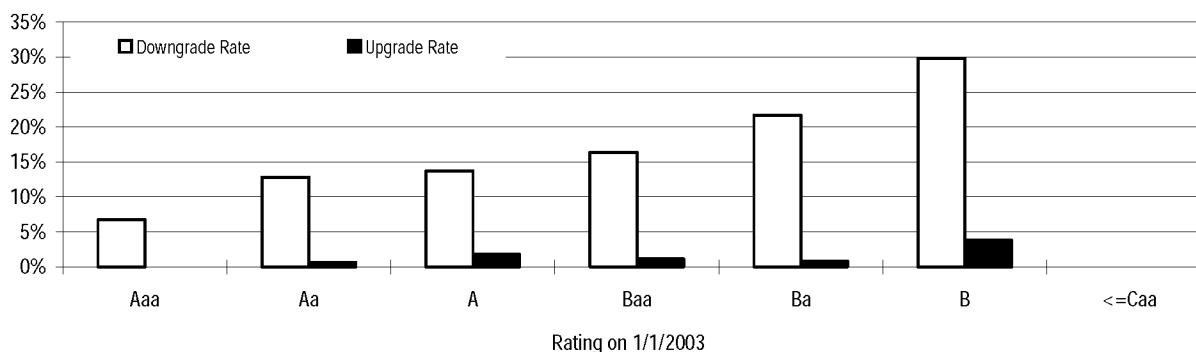
| 2003<br>Rating from: | Rating to: |        |        |        |        |        |              |
|----------------------|------------|--------|--------|--------|--------|--------|--------------|
|                      | Aaa        | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa                  | 93.27%     | 5.20%  | 1.22%  | 0.31%  |        |        |              |
| Aa                   | 0.65%      | 86.52% | 9.35%  | 3.04%  | 0.22%  | 0.22%  |              |
| A                    |            | 1.77%  | 84.48% | 8.65%  | 3.77%  | 0.89%  | 0.44%        |
| Baa                  |            | 0.16%  | 0.97%  | 82.47% | 9.42%  | 4.71%  | 2.27%        |
| Ba                   |            |        |        | 0.85%  | 77.46% | 10.70% | 10.99%       |
| B                    |            |        |        | 1.92%  | 1.92%  | 66.35% | 29.81%       |
| Caa or below         |            |        |        |        |        |        | 100.00%      |

| 1991-2003 average<br>Rating from: | Rating to: |        |        |        |        |        |              |
|-----------------------------------|------------|--------|--------|--------|--------|--------|--------------|
|                                   | Aaa        | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa                               | 94.14%     | 4.06%  | 1.10%  | 0.58%  | 0.06%  | 0.06%  |              |
| Aa                                | 0.56%      | 87.89% | 6.93%  | 3.29%  | 0.91%  | 0.35%  | 0.07%        |
| A                                 | 0.09%      | 1.24%  | 87.01% | 7.33%  | 2.65%  | 0.88%  | 0.80%        |
| Baa                               |            | 0.11%  | 0.64%  | 84.77% | 7.29%  | 4.15%  | 3.04%        |
| Ba                                |            |        |        | 1.09%  | 80.71% | 7.42%  | 10.78%       |
| B                                 |            |        |        | 0.56%  | 0.56%  | 70.14% | 28.73%       |
| Caa or below                      |            |        |        |        |        |        | 100.00%      |

As indicated, rating stability rates for CDOs in 2003 were above 80% for all investment-grade rating categories, with 93.3% for the Aaa rating category, 86.5% for the Aa rating category, 84.5% for the A rating category, and 82.5% for the Baa rating category in 2003. Long-term averages of CDO rating stability rates since 1991 were even higher, as CDO rating transitions were much less frequent before 2002.

Higher rated CDOs also sustained relatively lower downgrade rates (Figure 34).

**Figure 34 – Downgrade Rates and Upgrade Rates by Rating in CDOs in 2003**



CDO downgrades into the Caa or below rating category demonstrated impressive recovery relative to 2002 (Figure 35).

**Figure 35 – Rates of Downgrades into the Caa or Below Category in CDOs**

| Rating at the Beginning of a Year | 2003   | 2002   | 1991-2001 |
|-----------------------------------|--------|--------|-----------|
| Aaa                               |        |        |           |
| Aa                                |        | 0.31%  |           |
| A                                 | 0.44%  | 2.58%  |           |
| Baa                               | 2.27%  | 8.65%  | 0.49%     |
| Ba                                | 10.99% | 20.14% | 3.49%     |
| B                                 | 29.81% | 58.23% | 14.53%    |

### Multi-Year Rating Transition Matrices

The large number of CDO downgrades in the last two years has resulted in higher CDO downgrade rates over multi-year horizons.

Longer horizon rating stability rates were markedly lower in the CDO sector than in other sectors. A particularly interesting observation from Figure 36 is the fact that the CDO rating transition rates were much higher over a five-year horizon than over a two-year horizon. This is primarily because most of the growth within the relatively young CDO sector has occurred in the recent five years, resulting in only a small number of five-year cohorts. When the sector was severely impacted by the troubles in the corporate sector in 2001 and 2002, this limited number of five-year cohorts recorded extremely high downgrade rates.

**Figure 36 – Two-Year and Five-Year Rating Transition Matrices in CDOs (1991-2003)**

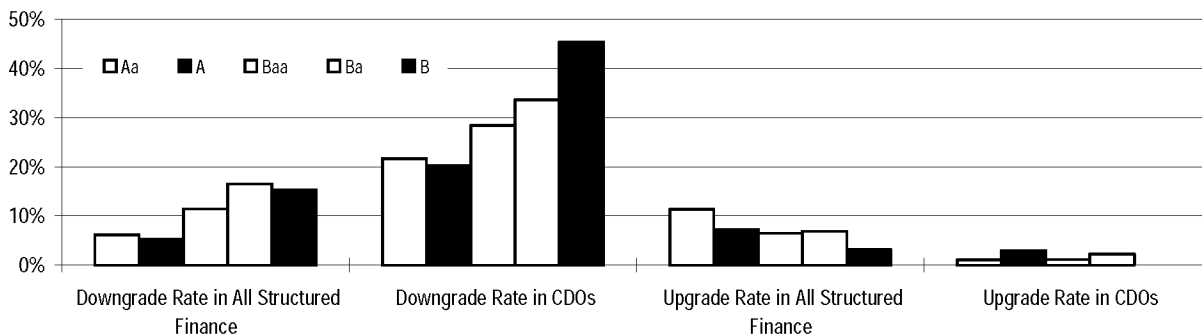
| Two-Year<br>Rating From: | Rating To: |        |        |        |        |        |              |
|--------------------------|------------|--------|--------|--------|--------|--------|--------------|
|                          | Aaa        | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa                      | 86.99%     | 7.32%  | 2.95%  | 1.93%  | 0.41%  | 0.30%  | 0.10%        |
| Aa                       | 1.10%      | 77.12% | 9.13%  | 7.48%  | 3.08%  | 1.32%  | 0.77%        |
| A                        | 0.16%      | 2.80%  | 76.81% | 8.22%  | 5.92%  | 2.47%  | 3.62%        |
| Baa                      |            | 0.17%  | 1.01%  | 70.32% | 9.11%  | 7.25%  | 12.14%       |
| Ba                       |            |        |        | 2.24%  | 64.10% | 8.81%  | 24.84%       |
| B                        |            |        |        |        |        | 54.62% | 45.38%       |
| Caa or below             |            |        |        |        |        |        | 100.00%      |

| Five-Year<br>Rating From: | Rating To: |        |        |        |        |        |              |
|---------------------------|------------|--------|--------|--------|--------|--------|--------------|
|                           | Aaa        | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa                       | 88.68%     | 3.77%  |        | 3.77%  |        | 1.89%  | 1.89%        |
| Aa                        | 1.05%      | 60.21% | 16.75% | 11.52% | 5.24%  | 1.57%  | 3.66%        |
| A                         |            | 14.63% | 63.41% | 2.44%  | 4.88%  | 9.76%  | 4.88%        |
| Baa                       |            |        | 0.54%  | 43.24% | 11.35% | 10.81% | 34.05%       |
| Ba                        |            |        |        | 4.08%  | 48.98% | 6.12%  | 40.82%       |
| B                         |            |        |        |        |        | 28.21% | 71.79%       |
| Caa or below              |            |        |        |        |        |        | 100.00%      |

Compared to rating transitions in other sectors, ratings in the CDO sector were downgraded more frequently over longer horizons (Figure 37).

**Figure 37 – Two-Year Downgrade and Upgrade Rates by Rating in CDOs and the All Structured Finance Category (1983-2003)**



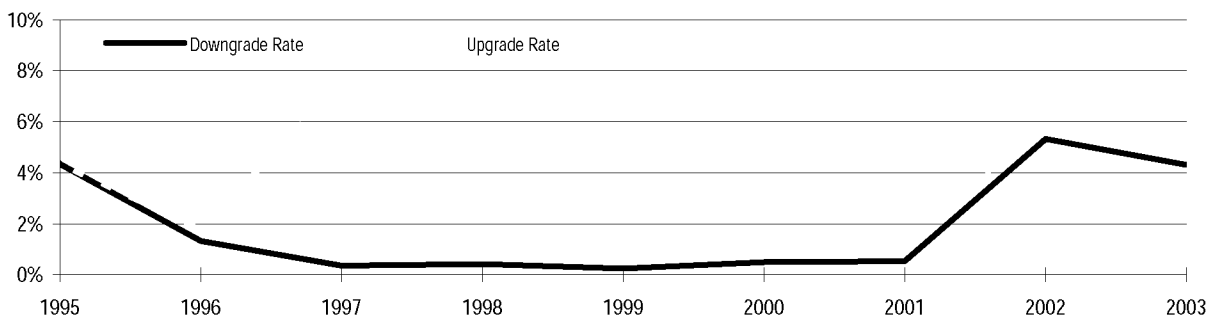
## CMBS

### *Downgrade and Upgrade Rates*

Out of a total universe of 3,301 CMBS ratings at the beginning of 2003, 133 ratings from 50 deals were downgraded, while 158 ratings from 53 deals were upgraded in 2003. Of the 133 downgrades, 11 were from the Asia Pacific region, 12 were from Europe, and 110 were from the U.S. Of the 158 upgrades, three were from the Asia Pacific region, seven were from Canada, three were from Europe, and 145 were from the U.S.

The downgrade rate declined to 4.3% in 2003, from 5.3% in 2002, while the upgrade rate rose to 5.1% in 2003, from 2.4% in 2002 (Figure 38).

**Figure 38 – Downgrade and Upgrade Rates in CMBS**



Of all 2003 CMBS downgrades, less than 20% sustained a downgrade in 2002, suggesting some CMBS rating downgrade momentum, but the momentum was weaker than those in the ABS and CDO sectors.

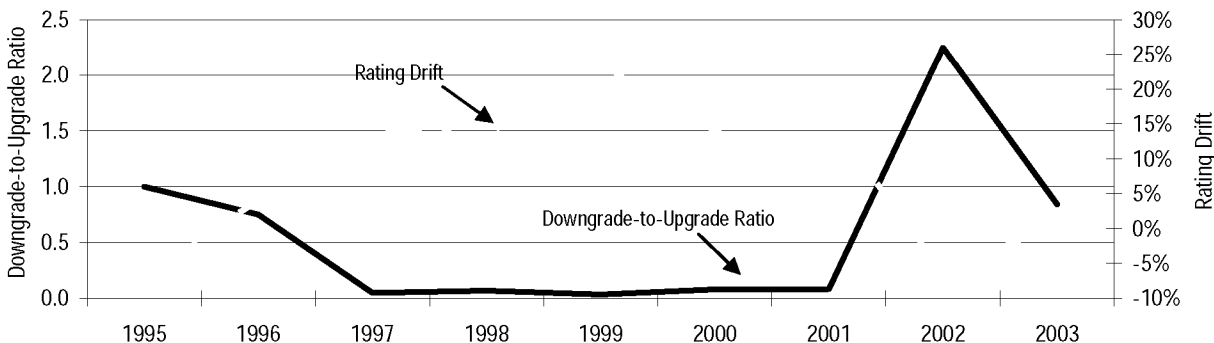
Moreover, of the 133 CMBS downgrades in 2003, 47 were from the 2000 vintage, 22 were from the 2001 vintage, and 25 were from the 2002 vintage. In total, more than 70% of the 2003 CMBS downgrades came from the latest three vintages, with the 2000 vintage alone contributing more than 35%.

In contrast, CMBS upgrades were less concentrated in recent vintages. In addition to 2000, 2001, and 2002 vintages, 1997, 1998, 1999 vintages also made substantial contributions to the rise in CMBS upgrades in 2003.

### *Rating Drift and Rating Volatility*

CMBS rating drift reversed its -6.4% downward trend in 2002, and returned to exhibit a positive drift of 0.7% in 2003. Overall, CMBS rating volatility increased slightly to 20.6% in 2003, from 17.9% in 2002. The downgrade-to-upgrade ratio dropped to 0.8 in 2003, from 2.3 in 2002 (Figure 39).

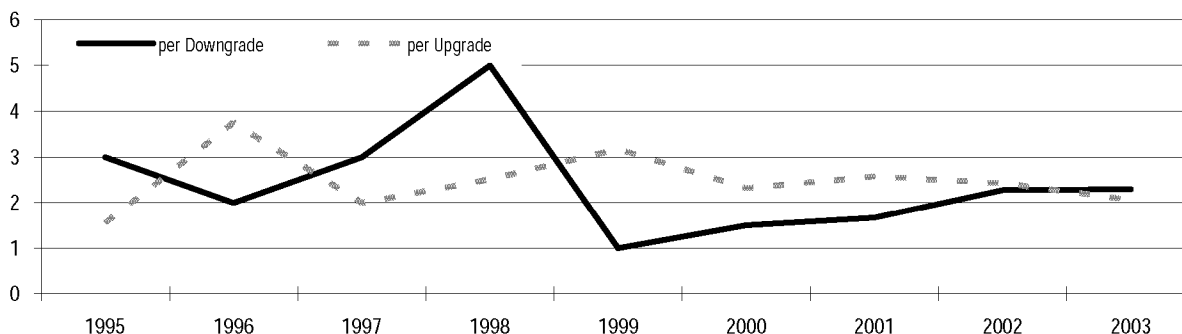
**Figure 39 – Rating Drift and Downgrade-to-Upgrade Ratio in CMBS**





The average number of total notches downgraded per year in CMBS remained the same at 2.3. For upgrades, the number of notches declined from 2.4 in 2002 to 2.1 in 2003. In addition, the number of notches changed per downgrade *action* decreased slightly from 2.1 to 2.0, as did the number of notches changed per upgrade *action*, which went from 2.5 in 2002 to 2.1 in 2003 (Figure 40).

**Figure 40 – Average Number of Notches Downgraded and Upgraded per Year in CMBS**



**One-Year Rating Transition Matrices**

Figure 41 presents two one-year CMBS rating transition matrices – one for 2003 alone and one for an average from 1988 to 2003.

**Figure 41 – One-Year Rating Transition Matrices in CMBS**

| 2003<br>Rating from: | Rating to: |        |        |        |        |        |              |
|----------------------|------------|--------|--------|--------|--------|--------|--------------|
|                      | Aaa        | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa                  | 99.34%     | 0.50%  | 0.17%  |        |        |        |              |
| Aa                   | 10.20%     | 88.03% | 1.77%  |        |        |        |              |
| A                    | 0.96%      | 4.24%  | 92.87% | 1.35%  | 0.58%  |        |              |
| Baa                  |            | 0.42%  | 1.82%  | 93.57% | 3.64%  | 0.56%  |              |
| Ba                   |            |        | 0.25%  | 1.47%  | 95.10% | 2.70%  | 0.49%        |
| B                    | 0.59%      |        |        | 0.29%  | 0.29%  | 92.65% | 6.18%        |
| Caa or below         |            |        |        |        |        | 2.27%  | 97.73%       |

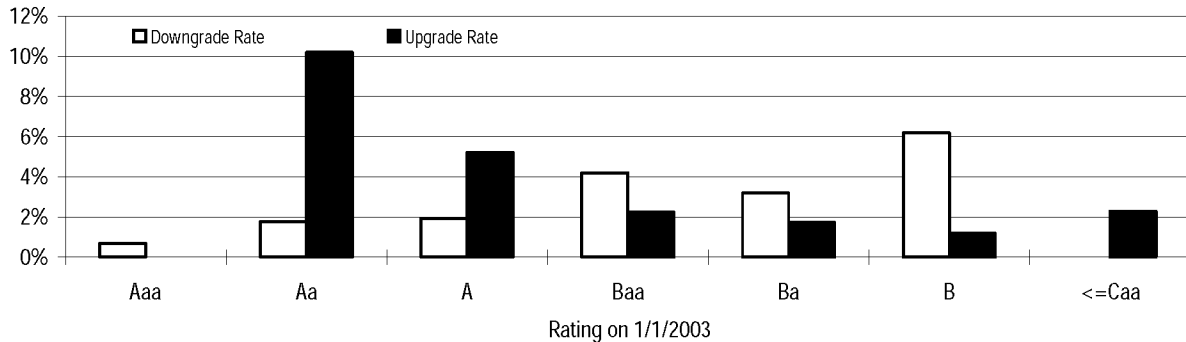
| 1988-2003 average<br>Rating from: | Rating to: |        |        |        |        |        |              |
|-----------------------------------|------------|--------|--------|--------|--------|--------|--------------|
|                                   | Aaa        | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa                               | 98.73%     | 1.23%  | 0.04%  |        |        |        |              |
| Aa                                | 6.55%      | 92.05% | 1.01%  | 0.22%  |        | 0.11%  | 0.06%        |
| A                                 | 1.21%      | 3.42%  | 93.61% | 1.49%  | 0.28%  |        |              |
| Baa                               | 0.38%      | 0.88%  | 2.52%  | 93.25% | 2.43%  | 0.42%  | 0.13%        |
| Ba                                |            |        | 0.59%  | 2.20%  | 94.58% | 2.12%  | 0.51%        |
| B                                 | 0.19%      |        | 0.10%  | 0.58%  | 1.17%  | 94.36% | 3.60%        |
| Caa or below                      |            |        |        |        |        | 2.50%  | 97.50%       |

As indicated in Figure 41, from 1988-2003 (the first CMBS rating transition experience appeared in our data sample in 1988), CMBS rating stability rates across all rating categories were well above 90%. The same was also true in 2003, with the exception of the Aa rating category that had a rating stability rate of 88%.

By rating category, upgrade rates were significantly higher than downgrade rates for the Aa and A rating categories in 2003, while downgrade rates were higher than upgrade rates for the Baa, Ba, and especially the B rating categories.

CMBS transition rates, especially upgrade rates, were also differentiated by rating at the beginning of 2003. Figure 42 shows how CMBS downgrade rates and upgrades rates differed by rating.

**Figure 42 – Downgrade Rates and Upgrade Rates by Rating in CMBS in 2003**



No CMBS security rated investment-grade at the beginning of 2003 was downgraded to the Caa or below category during the year. In fact, there were few downgrades into the Caa or below category overall from 1988 to 2003. This can be seen more clearly in Figure 43.

**Figure 43 – Rates of Downgrades into the Caa or Below Category in CMBS**

| Rating at the Beginning of a Year | 2003  | 2002  | 1988-2001 |
|-----------------------------------|-------|-------|-----------|
| Aaa                               |       |       |           |
| Aa                                |       |       | 0.10%     |
| A                                 |       |       |           |
| Baa                               |       |       | 0.28%     |
| Ba                                | 0.49% | 1.45% |           |
| B                                 | 6.18% | 5.02% | 0.89%     |

**Multi-Year Rating Transition Matrices**

In Figure 44 we show two rating transition matrices, one for the two-year horizon and the other for the five-year horizon.

**Figure 44 – Two-Year and Five-Year Rating Transition Matrices in CMBS (1988-2003)**

| Two-Year<br>Rating From: | Rating To: |        |        |        |        |        |              |
|--------------------------|------------|--------|--------|--------|--------|--------|--------------|
|                          | Aaa        | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa                      | 97.88%     | 1.86%  | 0.26%  |        |        |        |              |
| Aa                       | 10.47%     | 86.78% | 1.50%  | 0.58%  | 0.42%  | 0.08%  | 0.17%        |
| A                        | 2.17%      | 6.10%  | 88.13% | 2.34%  | 1.09%  | 0.08%  | 0.08%        |
| Baa                      | 1.13%      | 1.93%  | 5.18%  | 86.91% | 3.52%  | 0.93%  | 0.40%        |
| Ba                       |            | 0.41%  | 1.23%  | 3.68%  | 89.50% | 3.68%  | 1.50%        |
| B                        |            |        | 0.15%  | 1.36%  | 2.26%  | 89.61% | 6.63%        |
| Caa or below             |            |        |        |        |        | 5.41%  | 94.59%       |

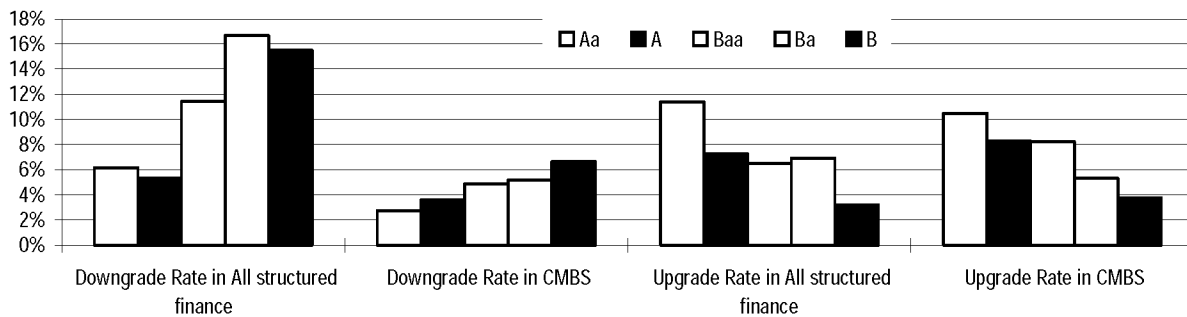
| Five-Year<br>Rating From: | Rating To: |        |        |        |        |        |              |
|---------------------------|------------|--------|--------|--------|--------|--------|--------------|
|                           | Aaa        | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa                       | 94.96%     | 2.80%  | 1.96%  | 0.28%  |        |        |              |
| Aa                        | 31.33%     | 61.45% | 1.20%  | 1.20%  | 3.61%  |        | 1.20%        |
| A                         | 8.11%      | 16.99% | 67.18% | 3.47%  | 3.86%  |        | 0.39%        |
| Baa                       | 6.54%      | 6.21%  | 17.32% | 66.67% | 1.63%  | 0.65%  | 0.98%        |
| Ba                        |            | 7.34%  |        | 9.17%  | 69.72% | 8.26%  | 5.50%        |
| B                         |            |        | 0.88%  | 5.26%  | 7.89%  | 71.05% | 14.91%       |
| Caa or below              |            |        |        |        |        | 23.08% | 76.92%       |

Figure 44 demonstrates that CMBS ratings have been stable over longer horizons. Moreover, from the two-year horizon to the five-year horizon, upgrade rates of all rating categories increased significantly, with the upgrade rates at the five-year horizon about three times as high as those at the two-year horizon. In other words, there is a strong tendency for ratings to be upgraded over long horizons such as five years.

Compared to those in other sectors, transition rates into the Caa or below category in CMBS have been much lower. Furthermore, when compared to the downgrade rates of structured finance as a whole, CMBS multi-year downgrade rates were lower while their upgrade rates were similar.

Figure 45 compares two-year rating transition rates between the CMBS sector and structured finance as a whole.

**Figure 45 – Two-Year Downgrade and Upgrade Rates by Rating in CMBS and All Structured Finance (1983-2003)**



## RMBS

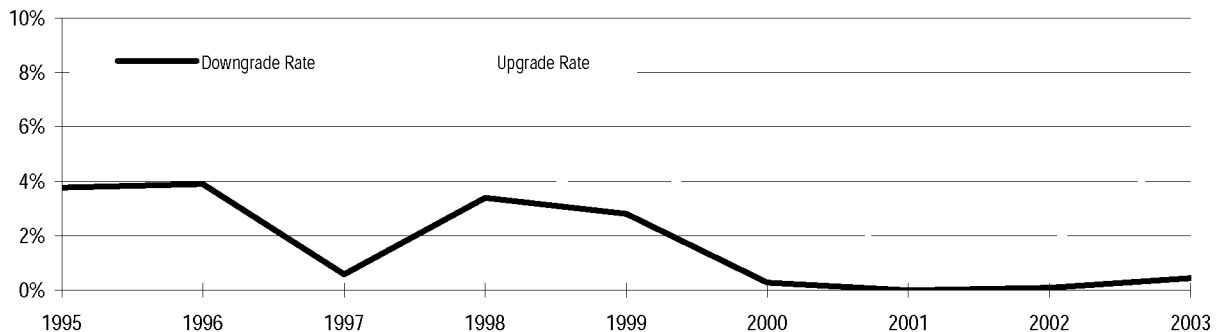
### *Downgrade and Upgrade Rates*

Out of a total universe of 5,795 RMBS ratings, only 26 ratings from 19 deals were downgraded, while 276 ratings from 90 deals were upgraded in 2003. Of the 26 downgrades, 19 were from the U.S., six were from Europe, and one from Latin America. Of the 276 upgrades, four were from the Asia Pacific region, 31 were from Europe, and 241 were from the U.S.

The downgrade rate remained low at 0.45% in 2003, and the upgrade rate increased significantly to 5.1% in 2003, from 1.7% in 2002 (Figure 46).

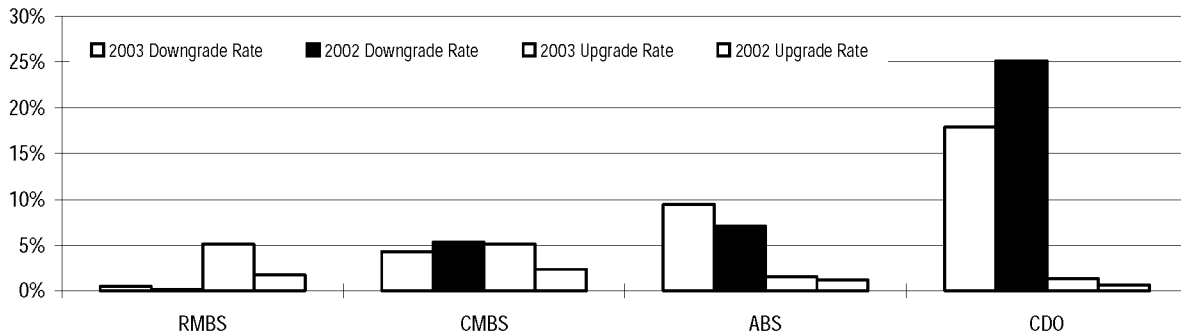
Of all RMBS upgrades in 2003, 141, or 51%, came from the 2002 vintage. The 2001 and 2000 vintages contributed 88 and 20 upgrades, respectively. In total, the 2002, 2001, and 2000 vintages combined made up 90% of all 2003 RMBS upgrades. The upgrades are attributable to strong housing economics and record-setting prepayment incentives.

**Figure 46 – Downgrade and Upgrade Rates in RMBS**



A comparison of downgrade and upgrade rates across all four sectors shows that RMBS clearly outperformed ABS, CDO, and even CMBS (Figure 47).

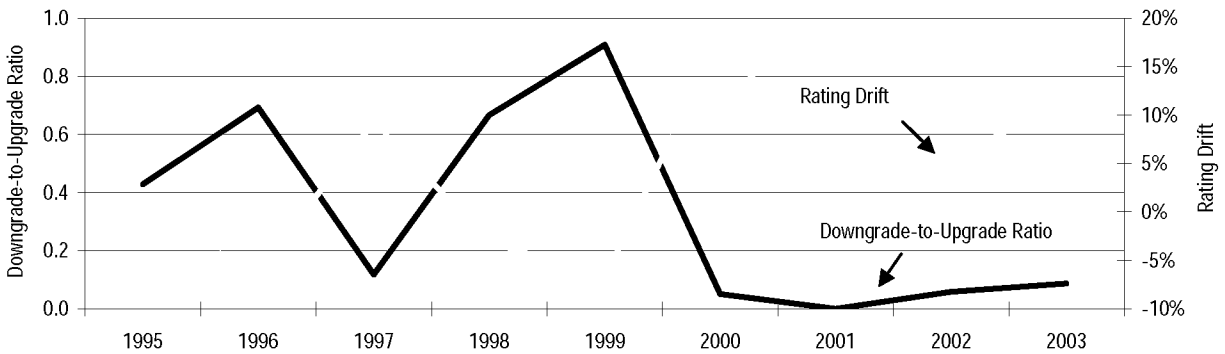
**Figure 47 – Downgrade and Upgrade Rates in RMBS and Other Structured Sectors**



**Rating Drift and Rating Volatility**

The trend of positive rating drift in RMBS started in 2000 and continued into 2003 with a drift of 11.5%, compared to 5.5% in 2002. High numbers of upgrades elevated RMBS rating volatility in 2003 relative to 2002. But the downgrade-to-upgrade ratio in RMBS has been the lowest of all structured finance sectors. In 2003, the ratio was less than 1:10 (Figure 48).

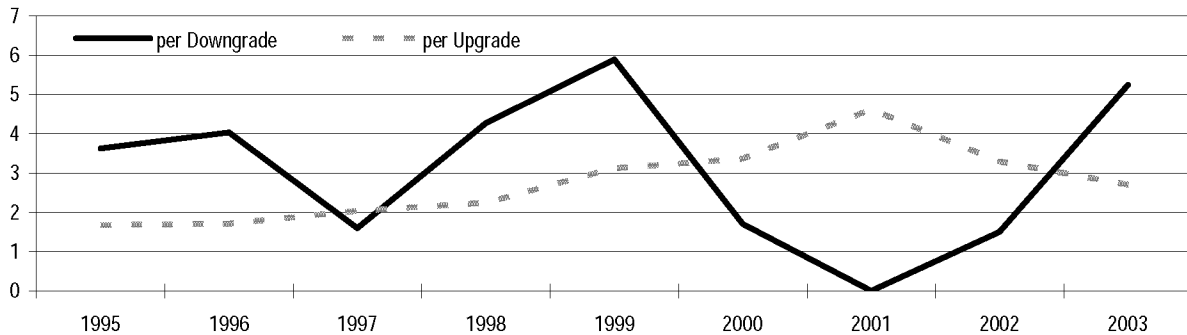
**Figure 48 – Rating Drift and Downgrade-to-Upgrade Ratio in RMBS**



Although the downgrade rate in RMBS was low, the average number of total notches downgraded per year, based on a small number of downgrades, rose dramatically in 2003 to 5.3, from 1.5 in 2002.

In contrast, the average number of total notches upgraded per year went down to 2.7, from 3.3 (Figure 49).

**Figure 49 – Average Number of Notches Downgraded and Upgraded per Year in RMBS**



**One-Year Rating Transition Matrices**

Figure 50 provides two one-year rating transition matrices for RMBS – one for 2003 only and one for an average during 1983-2003.

**Figure 50 – One-Year Rating Transition Matrices in RMBS**

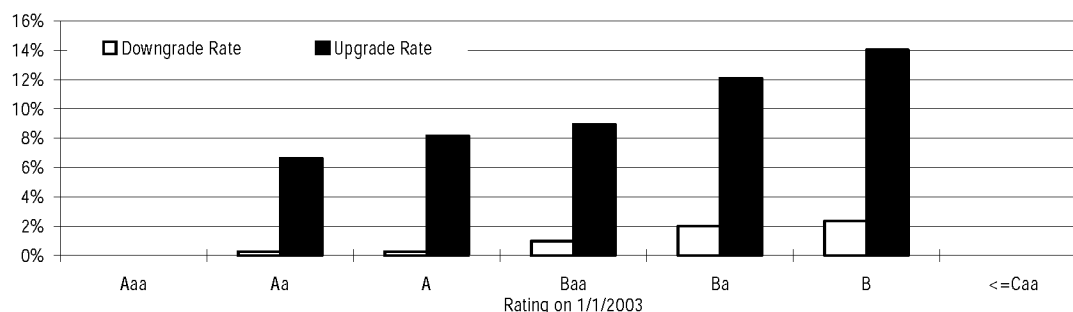
| 2003<br>Rating from: | Rating to: |        |        |        |        |        |              |
|----------------------|------------|--------|--------|--------|--------|--------|--------------|
|                      | Aaa        | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa                  | 100.00%    |        |        |        |        |        |              |
| Aa                   | 6.64%      | 93.10% | 0.13%  |        |        |        | 0.13%        |
| A                    | 0.52%      | 7.65%  | 91.57% | 0.26%  |        |        |              |
| Baa                  | 0.28%      | 0.56%  | 8.10%  | 90.08% | 0.14%  | 0.42%  | 0.42%        |
| Ba                   |            | 0.34%  | 0.67%  | 11.07% | 85.91% |        | 2.01%        |
| B                    |            |        |        | 2.34%  | 11.70% | 83.63% | 2.34%        |
| Caa or below         |            |        |        |        |        |        | 100.00%      |

| 1983-2003 average<br>Rating from: | Rating to: |        |        |        |        |        |              |
|-----------------------------------|------------|--------|--------|--------|--------|--------|--------------|
|                                   | Aaa        | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa                               | 99.44%     | 0.43%  | 0.10%  | 0.02%  |        |        | 0.02%        |
| Aa                                | 7.15%      | 90.63% | 1.81%  | 0.34%  | 0.02%  | 0.04%  | 0.01%        |
| A                                 | 1.73%      | 4.68%  | 91.49% | 1.73%  | 0.16%  | 0.02%  | 0.20%        |
| Baa                               | 0.55%      | 0.65%  | 3.97%  | 91.69% | 1.62%  | 0.74%  | 0.78%        |
| Ba                                | 0.16%      | 0.05%  | 1.20%  | 5.06%  | 89.34% | 1.58%  | 2.61%        |
| B                                 |            |        |        | 0.81%  | 2.43%  | 90.48% | 6.28%        |
| Caa or below                      |            |        |        |        | 0.18%  |        | 99.82%       |

As indicated, RMBS ratings have been highly stable and upgrades greatly exceeded downgrades in all rating categories in 2003. The upgrade rates of speculative-grade RMBS securities were particularly noteworthy, as 11.07% of the Ba rated securities were upgraded into the Baa rating category and 11.7% of the B rated securities were upgraded into the Ba rating category. The trend is largely attributable to deal de-leveraging, which resulted in higher upgrade rates in lowly rated securities (Figure 51).

**Figure 51 – Downgrade Rates and Upgrade Rates by Rating in RMBS in 2003**



RMBS downgrades into the Caa or below rating category were higher in 2003 relative to 2002, but were lower relative to the longer term window from 1983-2001 (Figure 52).

**Figure 52 – Rates of Downgrades into the Caa or Below Category in RMBS**

| Rating at the Beginning of a Year | 2003  | 2002* | 1983-2001 |
|-----------------------------------|-------|-------|-----------|
| Aaa                               |       |       | 0.02%     |
| Aa                                | 0.13% |       |           |
| A                                 |       |       | 0.28%     |
| Baa                               | 0.42% |       | 1.00%     |
| Ba                                | 2.01% |       | 3.15%     |
| B                                 | 2.34% |       | 8.19%     |

\* No RMBS securities were downgraded into the Caa or below category in 2002.

### Multi-Year Rating Transition Matrices

Rating transition matrices in RMBS over multi-year horizons further demonstrate that RMBS ratings have been stable across the longer term as well.

Compared to other sectors, rating stability rates in RMBS were generally higher than in ABS, except for the Aa and A rating categories that sustained high upgrade rates in the RMBS sector. Overall RMBS rating stability rates were much higher than in the CDO sector, but lower than in the CMBS sector.

Additionally, the rating stability rate of the Aaa rating category in RMBS has been the highest among all sectors. In Figure 53, we present a two-year and a five-year rating transition matrix for RMBS.

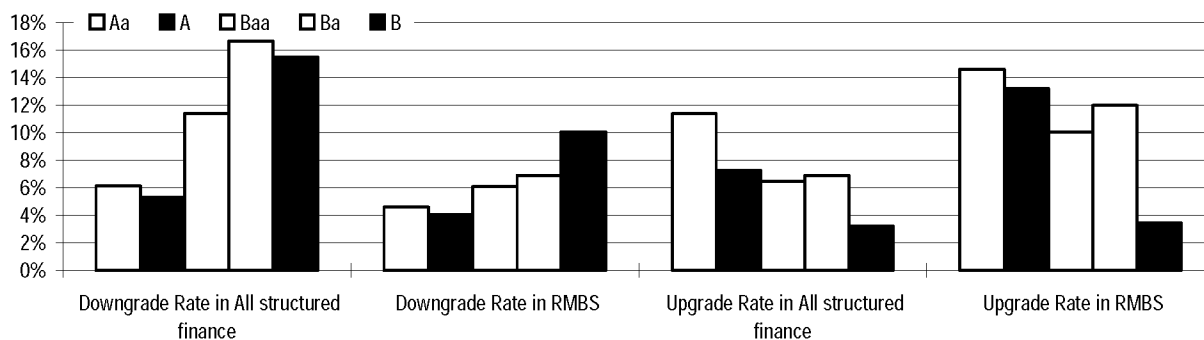
**Figure 53 – Two-Year and Five-Year Rating Transition Matrices in RMBS (1983-2003)**

| Two-Year<br>Rating From: | Rating To: |        |        |        |        |        |              |
|--------------------------|------------|--------|--------|--------|--------|--------|--------------|
|                          | Aaa        | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa                      | 98.72%     | 0.87%  | 0.23%  | 0.06%  |        |        | 0.11%        |
| Aa                       | 14.61%     | 80.81% | 3.35%  | 0.98%  | 0.12%  | 0.05%  | 0.09%        |
| A                        | 4.75%      | 8.46%  | 82.74% | 2.49%  | 0.91%  | 0.23%  | 0.42%        |
| Baa                      | 1.29%      | 1.64%  | 7.10%  | 83.87% | 2.01%  | 1.58%  | 2.50%        |
| Ba                       | 0.41%      | 0.07%  | 2.91%  | 8.60%  | 81.10% | 1.90%  | 5.01%        |
| B                        |            |        |        | 1.72%  | 1.72%  | 86.49% | 10.07%       |
| Caa or below             |            |        |        |        | 0.47%  |        | 99.53%       |

| Five-Year<br>Rating From: | Rating To: |        |        |        |        |        |              |
|---------------------------|------------|--------|--------|--------|--------|--------|--------------|
|                           | Aaa        | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa                       | 96.72%     | 1.93%  | 0.57%  | 0.19%  | 0.02%  | 0.06%  | 0.52%        |
| Aa                        | 36.63%     | 53.98% | 5.04%  | 2.28%  | 0.50%  | 0.45%  | 1.12%        |
| A                         | 16.91%     | 17.82% | 57.36% | 3.55%  | 1.15%  | 0.86%  | 2.35%        |
| Baa                       | 4.61%      | 4.40%  | 15.45% | 62.81% | 1.47%  | 2.15%  | 9.11%        |
| Ba                        | 1.46%      | 0.97%  | 9.47%  | 18.33% | 58.98% | 1.94%  | 8.86%        |
| B                         |            |        |        | 5.32%  | 2.13%  | 72.61% | 19.95%       |
| Caa or below              |            |        |        |        | 3.08%  |        | 96.92%       |

Figure 54 compares two-year RMBS downgrade and upgrade rates with the same rates in structured finance as a whole. As indicated, compared to structured finance as a whole, the RMBS Aa and A rating categories sustained particularly high upgrade rates over the two-year horizon, while the Baa and below rating categories sustained low downgrade rates.

**Figure 54 – Two-Year Downgrade and Upgrade Rates by Rating in RMBS (1983-2003)**



## Regional Comparisons of Rating Transitions

At the end of 2003, there were more than 3,000 European structured securities in our data sample.<sup>12</sup> This represents a share of 12.7% in global structured finance. By comparison, at the end of 2002, European securities totaled about 2,200, roughly 11.5% of the global total.

In the Asia Pacific region, the number of outstanding securities increased to 1,123 at the beginning of 2004 from 823 at the beginning of 2003. Its share as a percent of the global total reached 4.6% in 2003.

In addition, at the end of 2003, there were about 200 structured finance ratings in Canada and Latin America. The combined share from these two regions comprised less than 1% of the global sample in 2003. Consequently, we do not segregate their rating transition rates in this study.

The share of U.S. structured securities in the global data sample declined slightly in 2003 to 81.9%, from 83.6% in 2002. Despite the decline in its share, rating transitions of U.S. structured securities continued to dominate the rating transitions of global structured finance as a whole.

### EUROPEAN AND U.S. RATING TRANSITION RATES

Out of a total universe of 2,180 European ratings at the beginning of 2003, 209 were downgraded and 56 were upgraded in 2003, while in the U.S., out of a total of 15,834 ratings, 1,041 were downgraded and 483 were upgraded. Of the 209 European securities downgraded, 177, or about 84%, were CDOs.

In both Europe and the U.S., the downgrade rate continued to exceed the upgrade rate in 2003. In Europe, the downgrade rate was 10.2%, and the upgrade rate was 2.7%. In the U.S. the downgrade rate was 7.0% and the upgrade rate was 3.2%. Figure 55 compares the rating transition trends across Europe and the U.S.

12. This discussion excludes derivatives, which we address in the next section.

**Figure 55 – Downgrade and Upgrade Rates in Europe and the U.S.**

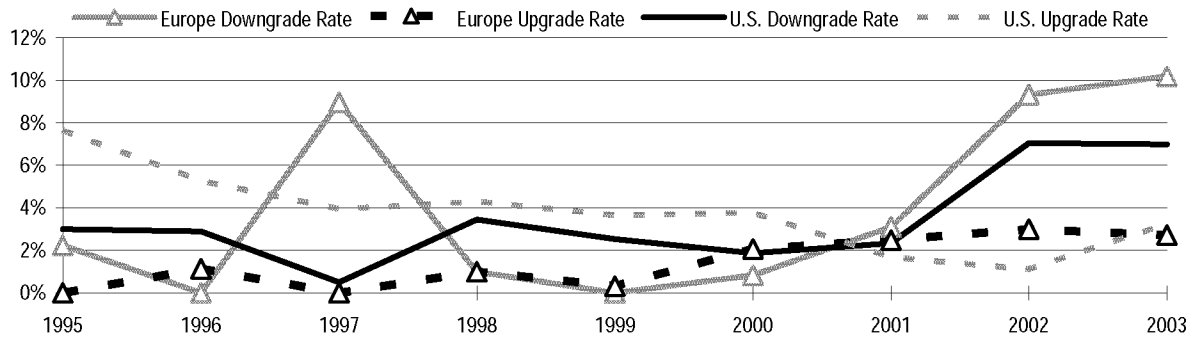


Figure 55 shows that in recent years both downgrade rate and upgrade rate among European structured securities have been higher than those in the U.S.

In Europe, the downgrade-to-upgrade ratio rose to 3.7:1 in 2003 from 3:1 in 2002, and the rating stability rate was 87%, as in 2002. In comparison, 2003 U.S. downgrade-to-upgrade ratio was 2:1, and the rating stability rate was about 90%. High downgrade-to-upgrade ratio in Europe was the result of a large percentage of CDOs among European structured finance securities.

Figure 56 compares 2003 rating transition matrices in Europe and in the U.S.

**Figure 56 – European and U.S. One-Year Rating Transition Matrices in 2003**

| Europe<br>Rating from: | Rating to: |        |        |        |        |        |              |
|------------------------|------------|--------|--------|--------|--------|--------|--------------|
|                        | Aaa        | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa                    | 97.06%     | 2.63%  | 0.31%  |        |        |        |              |
| Aa                     | 0.86%      | 90.54% | 5.44%  | 3.15%  |        |        |              |
| A                      | 0.20%      | 2.81%  | 90.18% | 5.01%  | 1.80%  |        |              |
| Baa                    |            |        | 2.70%  | 91.11% | 4.58%  | 0.81%  | 0.81%        |
| Ba                     |            |        |        | 0.73%  | 81.75% | 13.14% | 4.38%        |
| B                      |            |        |        | 6.90%  | 6.90%  | 62.07% | 24.14%       |
| Caa or below           |            |        |        |        |        |        | 100.00%      |

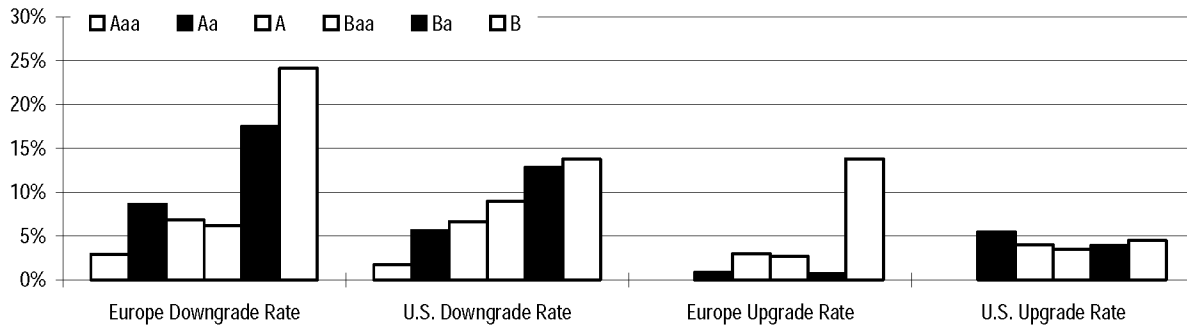
| U.S.<br>Rating from: | Rating to: |        |        |        |        |        |              |
|----------------------|------------|--------|--------|--------|--------|--------|--------------|
|                      | Aaa        | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa                  | 98.27%     | 0.91%  | 0.54%  | 0.24%  | 0.04%  |        |              |
| Aa                   | 5.48%      | 88.89% | 3.18%  | 1.43%  | 0.74%  | 0.23%  | 0.05%        |
| A                    | 0.73%      | 3.24%  | 89.38% | 3.67%  | 1.53%  | 1.16%  | 0.29%        |
| Baa                  | 0.38%      | 0.26%  | 2.86%  | 87.56% | 3.65%  | 2.78%  | 2.52%        |
| Ba                   | 0.09%      | 0.09%  | 0.17%  | 3.61%  | 83.23% | 3.87%  | 8.94%        |
| B                    | 0.30%      |        |        | 0.75%  | 3.44%  | 81.74% | 13.77%       |
| Caa or below         |            |        |        |        |        |        | 100.00%      |

As indicated, rating stability rates were generally similar across European and the U.S. structured securities except for the B rating category in Europe. This category sustained both higher downgrade and upgrade rates in 2003.

Upgrades by one broad rating category were more frequent in the U.S. than in Europe (Figure 56). Overall downgrade and upgrade rates by rating are shown in Figure 57.



**Figure 57 – European and U.S. Downgrade and Upgrade Rates by Rating in 2003**



Significantly, Figure 56 also reveals that the rate of downgrades into the Caa or below rating category was quite different across European and the U.S. regions. The rates of U.S. structured securities falling into the Caa category were considerably higher than in the European structured market, except for the B rating category (Figure 58).

**Figure 58 – Rates of Downgrades into the Caa or Below Category: Europe and the U.S.**

| Rating at the Beginning of a Year | Europe |        |           | U.S.   |        |           |
|-----------------------------------|--------|--------|-----------|--------|--------|-----------|
|                                   | 2003   | 2002   | 1992-2001 | 2003   | 2002   | 1983-2001 |
| Aaa                               |        |        |           |        | 0.18%  | 0.02%     |
| Aa                                |        |        |           | 0.05%  | 0.65%  | 0.02%     |
| A                                 |        |        |           | 0.29%  | 0.51%  | 0.13%     |
| Baa                               | 0.81%  | 1.77%  | 0.36%     | 2.52%  | 2.22%  | 0.63%     |
| Ba                                | 4.38%  | 7.14%  |           | 8.94%  | 13.03% | 2.82%     |
| B                                 | 24.14% | 66.67% |           | 13.77% | 14.14% | 7.45%     |

**ASIA PACIFIC AND U.S. RATING TRANSITION RATES**

At the beginning of 2003, our data sample contains 823 ratings in the Asia Pacific region. Of these, 17 ratings downgraded and 22 upgraded. The downgrade rate in the Asia Pacific region fell to 2.3% in 2003, from 3.4% in 2002, while its upgrade rate also declined to 3% from 4.5%. The rating stability rate increased to 94.7% from 92.1%. Figure 59 compares downgrade and upgrade rates in the Asia Pacific and the U.S.

**Figure 59 – Downgrade and Upgrade Rates in the Asia Pacific Region and the U.S.**

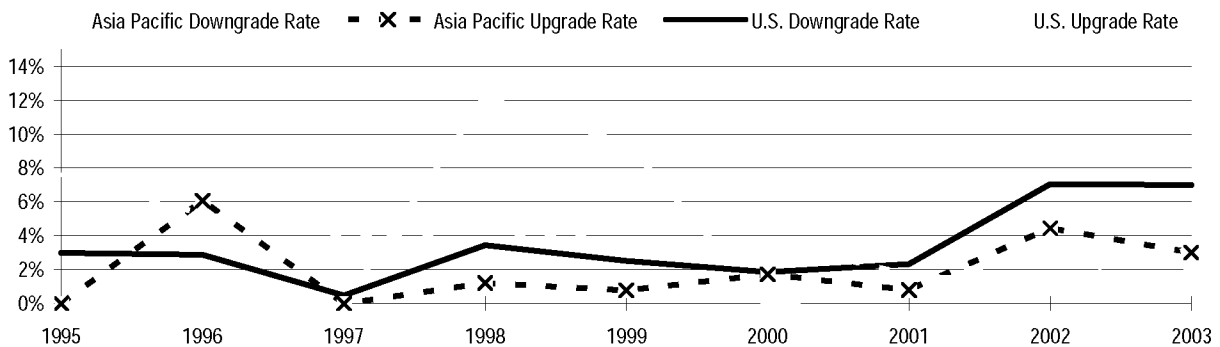


Figure 59 reveals that the downgrade rate has been lower in the Asia Pacific region since 2000, while the upgrade rate has been higher than in the U.S., although the total number of securities was still small in the Asia Pacific region.

Meanwhile, the average number of notches changed in the Asia Pacific region increased to 2.9 from 2.4 per downgrade, and to 2.4 from 2.3 per upgrade. The rating drift remained positive at 0.4% in 2003, while the rating volatility dropped to 13.8% from 18.6%.

Figure 60 compares the 2003 rating transition matrices for the Asia Pacific region and the U.S. As indicated, structured finance ratings in the Asian Pacific region were more stable than in the U.S. in 2003. The rating stability of the Ba rating category is particularly noteworthy.

No securities rated investment grade at the beginning of 2003 were downgraded into the Caa or below rating category during the year.

**Figure 60 – Asia Pacific and U.S. One-Year Rating Transition Matrices in 2003**

| Asia Pacific<br>Rating from: | Rating to: |        |        |        |        |        |              |
|------------------------------|------------|--------|--------|--------|--------|--------|--------------|
|                              | Aaa        | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa                          | 99.41%     | 0.30%  | 0.30%  |        |        |        |              |
| Aa                           | 8.00%      | 89.60% | 2.40%  |        |        |        |              |
| A                            | 0.81%      | 4.07%  | 93.50% |        | 1.63%  |        |              |
| Baa                          |            | 1.94%  | 3.88%  | 91.26% | 0.97%  | 1.94%  |              |
| Ba                           |            |        |        |        | 97.22% |        | 2.78%        |
| B                            |            |        |        |        |        | 80.00% | 20.00%       |
| Caa or below                 |            |        |        |        |        |        |              |

| U.S.<br>Rating from: | Rating to: |        |        |        |        |        |              |
|----------------------|------------|--------|--------|--------|--------|--------|--------------|
|                      | Aaa        | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa                  | 98.27%     | 0.91%  | 0.54%  | 0.24%  | 0.04%  |        |              |
| Aa                   | 5.48%      | 88.89% | 3.18%  | 1.43%  | 0.74%  | 0.23%  | 0.05%        |
| A                    | 0.73%      | 3.24%  | 89.38% | 3.67%  | 1.53%  | 1.16%  | 0.29%        |
| Baa                  | 0.38%      | 0.26%  | 2.86%  | 87.56% | 3.65%  | 2.78%  | 2.52%        |
| Ba                   | 0.09%      | 0.09%  | 0.17%  | 3.61%  | 83.23% | 3.87%  | 8.94%        |
| B                    | 0.30%      |        |        | 0.75%  | 3.44%  | 81.74% | 13.77%       |
| Caa or below         |            |        |        |        |        |        | 100.00%      |

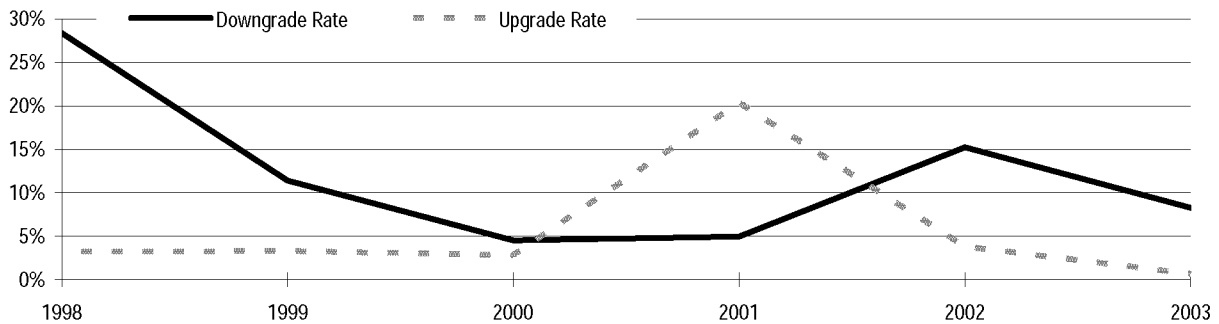
## Rating Transitions in the Derivatives Sector

At the end of 2003, a total of 1,494 ratings were outstanding in the derivatives sector. Of these, 56 were from the Asia Pacific region, 463 were from Europe, and 975 were from the U.S. In comparison, at the beginning of 2001, the total number of ratings was 722, only about half of the current level. By the end of 2003, the largest two deal types in this sector were structured notes and repackaged securities, with structured notes making up about 50%, and repackaged securities making up about 30% of the total.

These two deal types were followed by structured covered bonds and credit derivatives, whose shares in this sector were still in single digits.

In 2003, derivatives ratings worldwide sustained an 8.3% downgrade rate. This was down from 15.3% in 2002. The upgrade rate was merely 0.7%, although it was also down from 3.8% in 2002. A total of 94 ratings were downgraded. The rating stability rate for this sector was above 90%, greatly exceeding 80%, the level in 2002. Figure 61 further depicts the trends in this sector.

**Figure 61 – Downgrade and Upgrade Rates in Derivatives**



The magnitude of rating actions in derivatives has been smaller than in other major structured finance sectors. This may be due in part to the fact that a large number of derivatives ratings were directly linked to a specific corporate rating. In fact, the magnitude of rating changes in derivatives is more similar to those of corporate rating changes than to those of structured rating changes.

The average number of total notches downgraded per year was 2.3 in 2003, compared to 3.3 for CDOs, and 5.3 for ABS. The average number of total notches upgraded per year was even smaller at 1.4 in 2003, compared with 2.4 for CDOs, and 3.2 for ABS.

Meanwhile, both the rating drift and the rating volatility decreased in 2003. The drift fell from -35.3% to -18.5%, and the volatility fell from 45.4% to 20.4%.

By broad rating, derivatives downgrade rate dropped 5 percentage points from its 2002 level, to 5.4% in 2003. This level, however, was still above the historical average of 3.7% from 1992 to 2001. Figure 62 lists two transition matrices: one for 2003 alone and one for the 1992-2003 average.

**Figure 62 – One-Year Rating Transition Matrices in Derivatives**

| 2003 only<br>Rating from: | Rating to: |        |        |        |        |        |              |
|---------------------------|------------|--------|--------|--------|--------|--------|--------------|
|                           | Aaa        | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa                       | 100.00%    |        |        |        |        |        |              |
| Aa                        | 0.30%      | 94.83% | 4.56%  |        | 0.30%  |        |              |
| A                         |            |        | 92.04% | 7.46%  |        | 0.50%  |              |
| Baa                       |            |        |        | 93.16% | 4.21%  | 2.11%  | 0.53%        |
| Ba                        |            |        |        |        | 89.04% | 9.59%  | 1.37%        |
| B                         |            |        |        |        |        | 68.00% | 32.00%       |
| <=Caa                     |            |        |        |        |        | 16.67% | 83.33%       |

| 1992-2003 average<br>Rating from: | Rating to: |        |        |        |        |        |              |
|-----------------------------------|------------|--------|--------|--------|--------|--------|--------------|
|                                   | Aaa        | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa                               | 97.49%     | 2.42%  | 0.08%  |        |        |        |              |
| Aa                                | 0.54%      | 95.20% | 4.18%  |        | 0.08%  |        |              |
| A                                 | 0.12%      | 10.66% | 82.20% | 5.50%  | 0.82%  | 0.23%  | 0.47%        |
| Baa                               |            |        | 2.42%  | 85.69% | 8.27%  | 1.61%  | 2.02%        |
| Ba                                |            |        |        | 2.02%  | 89.90% | 6.06%  | 2.02%        |
| B                                 |            |        |        |        |        | 89.25% | 10.75%       |
| Caa or below                      |            |        |        |        |        | 6.90%  | 93.10%       |

As indicated by the data in Figure 62, derivatives rating stability rates in 2003 were higher than or similar to the long-term averages from 1992-2003, except for the B rating category. Securities rated B at the beginning of 2003 sustained a 32% downgrade rate. This not only resulted in a lower rating stability rate for the B rating, but also made the B rating category the only category to exhibit higher rate of downgrades into the Caa or below category over 2002. This finding is summarized in Figure 63.

**Figure 63 – Rates of Downgrades into the Caa or Below Category In Derivatives**

| Rating at the Beginning of a Year | 2003   | 2002  | 1992-2001 |
|-----------------------------------|--------|-------|-----------|
| Aaa                               |        |       |           |
| Aa                                |        |       |           |
| A                                 |        | 2.31% |           |
| Baa                               | 0.53%  | 3.62% | 2.38%     |
| Ba                                | 1.37%  | 4.88% | 1.19%     |
| B                                 | 32.00% | 5.00% | 2.08%     |

## Appendix I: Terminology

---

### *Downgrade (or Upgrade) Rate*

A security is downgraded (upgraded) if its rating at the end of a year is lower (higher) than at the beginning of the year on the basis of ratings with numeric modifiers (also known as refined ratings or modified ratings). The downgrade rate is the number of securities downgraded (or upgraded) divided by the total number of outstanding securities at the beginning of the year that excludes ratings withdrawn during the year. In measuring downgrade rates and upgrade rates, only ratings at the beginning and the end of the year are considered.

### *Weighted-Downgrade (or Upgrade) Rate*

This term refers to the number of securities downgraded (or upgraded), weighted by the total number of notches changed per downgrade (upgrade) from the beginning to the end of a year, divided by the total number of outstanding securities at the beginning of the year, after excluding ratings withdrawn during the year. For example, a security downgraded from Baa1 at the beginning of the year to Ba1 at the end of the year is counted as three downgrades to get a weighted-downgrade rate, but counted as only one downgrade to get the unweighted downgrade rate. In cases where both the number of total notches changed over a year is very large and the rate of downgrades is high, the weighted-downgrade rate can exceed 100%. This was the case for the CDO sector in 2002.

### *Rating Stability Rate*

The number of securities that did not change ratings, on the basis of ratings with numeric modifiers, from the beginning to the end of the year, divided by the total number of outstanding securities at the beginning of the year, after excluding ratings withdrawn during the year. Only ratings at the beginning and the end of the year are used.

### *Broad Ratings and Refined Ratings*

Broad ratings refer to long-term bond rating categories: Aaa, Aa, A, Baa, Ba, B, and Caa or below. Refined ratings or ratings with numeric modifiers refer to Aaa, Aa1, Aa2, Aa3, A1, A2, A3, Baa1, Baa2, Baa3, Ba1, Ba2, Ba3, B1, B2, B3, Caa1, Caa2, Caa3, Ca, and C. The broad rating category Caa or below includes the following refined ratings: Caa1, Caa2, Caa3, Ca, and C.

### *Average Number of Total Notches Downgraded (Upgraded) per Year*

This refers to the number of total notches downgraded (upgraded) over an entire year, averaged across all securities downgraded (upgraded) during the year. A security can experience multiple rating actions during the year. Therefore, this is different from the number of notches changed per rating *action*.

### *Rating Drift*

The weighted upgrade rate minus the weighted downgrade rate.

### *Rating Volatility*

The weighted upgrade rate plus the weighted downgrade rate.

### *Downgrade-to-Upgrade Ratio*

This refers to the total number of unweighted downgrades divided by the total number of unweighted upgrades.

### *Downgrade (Upgrade) Rate by Broad Rating*

A downgrade (upgrade) occurs only if a security changes its rating across two broad rating categories. For example, a rating change from Baa1 to Ba2 is considered a downgrade by broad rating. A rating change from Baa1 to Baa3 is not counted as a downgrade by broad rating, but is considered to be a downgrade by refined rating (this is the standard case).

### *Cohort*

A cohort contains all rated securities outstanding at the beginning of a year regardless of when a security was issued. The length of a cohort is the number of years during which a security's rating will be examined. For example, a one-year cohort is formed for the purpose of examining rating changes over a one-year period. A three-year cohort is formed for the purpose of examining rating changes over a three-year period. Only the ratings outstanding at the beginning and end of the three-year period are used.

### *Rating Transition Matrix*

A one-year rating transition matrix specifies the frequencies of ratings changed from a starting rating category at the beginning of a year to an end rating category at the end of a year (typically by broad rating). A multi-year rating transition matrix reports the frequencies of ratings changed from a starting rating category at the beginning of a multi-year cohort to an end rating category at the end of the multi-year cohort (typically by broad rating).

### *Treatment of Withdrawn Ratings (WR)*

In calculating rating transition rates for the main text of this special comment, ratings that were withdrawn during a given cohort period (one-year or multiple-year) were excluded from the total number of outstanding securities at the beginning of the cohort period. In the appendix to follow, all reported transition matrices contain a column (the last column) of frequencies of rating withdrawn, by rating. These transition matrices provide a complete account of rating transitions.

To get the same transition matrices as those reported in the text, which exclude withdrawn ratings from the population, please divide all rating transition rates in each row (i.e. all cell values except the last) by, one minus the rate of ratings withdrawn (the last cell, WR, in that row).

### *ABS*

This refers to Asset-Backed-Securities. This structured finance sector includes securities backed by home-equity loans (HEL) in addition to both traditional (autos, credit cards, leases, manufactured housing, student loans, etc.) and non-traditional (mutual fund fees, tax liens, tobacco settlement bonds, whole business securitizations (ABS), etc) asset classes.

### *CDO*

This refers to collateralized debt obligations. Derivative securities such as repackaged securities, structured notes, and credit derivatives are not considered to be part of this sector.

### *CMBS*

This refers to commercial mortgage backed securities.

### *RMBS*

This refers to residential mortgage backed securities. The large majority of these securities are backed by first-lien prime mortgages. Some are backed by Alt-A mortgages.

### *Derivatives*

This sector contains structured notes, repackaged securities, and credit derivatives. Structured covered bonds, catastrophe linked notes, and structured investment vehicles are also included in this sector.

### *All Structured Finance*

This includes global structured securities in four major sectors: ABS, CDO, CMBS, and RMBS. We exclude the derivatives sector from this term to better capture rating transition experiences among core structured finance securities by isolating the influence from corporate rating transitions on structured finance as a whole.

### *U.S. Structured Finance Securities*

This refers to structured finance securities denominated in U.S. dollars and issued in the U.S. market.

### *European Structured Finance Securities*

This includes securities denominated in a European currency or issued in a European country.

### *Asia Pacific Structured Finance Securities*

This includes securities denominated in an Asian-Pacific region currency or issued in an Asian-Pacific country that includes Japan and Australia.

## Appendix II: Transition Matrices

**Figure 64 – All Structured Finance Rating Transition Matrices (Weighted Averages, 1983-2003)**

| 1-year       | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
|--------------|--------|--------|--------|--------|--------|--------|--------------|--------|
| Aaa          | 90.95% | 0.75%  | 0.18%  | 0.07%  | 0.01%  | 0.01%  | 0.03%        | 8.00%  |
| Aa           | 5.19%  | 86.36% | 2.13%  | 0.73%  | 0.18%  | 0.08%  | 0.08%        | 5.26%  |
| A            | 0.97%  | 2.28%  | 87.79% | 2.08%  | 0.68%  | 0.27%  | 0.19%        | 5.74%  |
| Baa          | 0.42%  | 0.48%  | 2.10%  | 86.44% | 3.49%  | 1.50%  | 1.25%        | 4.31%  |
| Ba           | 0.11%  | 0.06%  | 0.61%  | 3.44%  | 82.94% | 3.50%  | 5.88%        | 3.46%  |
| B            | 0.07%  |        | 0.07%  | 0.64%  | 1.46%  | 84.14% | 10.14%       | 3.46%  |
| Caa or below |        |        |        |        | 0.08%  | 0.24%  | 90.64%       | 9.04%  |
| 2-year       | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
| Aaa          | 81.17% | 1.17%  | 0.32%  | 0.15%  | 0.03%  | 0.03%  | 0.10%        | 17.04% |
| Aa           | 10.10% | 73.15% | 3.16%  | 1.36%  | 0.46%  | 0.23%  | 0.24%        | 11.29% |
| A            | 2.32%  | 4.01%  | 76.06% | 2.38%  | 1.13%  | 0.47%  | 0.66%        | 12.98% |
| Baa          | 1.01%  | 1.08%  | 3.85%  | 74.83% | 4.42%  | 2.39%  | 3.60%        | 8.83%  |
| Ba           | 0.28%  | 0.20%  | 1.49%  | 4.42%  | 70.65% | 3.99%  | 11.41%       | 7.57%  |
| B            | 0.05%  |        | 0.15%  | 1.21%  | 1.50%  | 73.92% | 14.08%       | 9.10%  |
| Caa or below |        |        |        |        | 0.26%  | 0.52%  | 80.39%       | 18.83% |
| 3-year       | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
| Aaa          | 71.25% | 1.28%  | 0.38%  | 0.17%  | 0.04%  | 0.03%  | 0.16%        | 26.69% |
| Aa           | 15.01% | 60.74% | 3.60%  | 1.72%  | 0.69%  | 0.32%  | 0.33%        | 17.60% |
| A            | 3.61%  | 5.39%  | 64.45% | 2.13%  | 1.09%  | 0.62%  | 1.05%        | 21.67% |
| Baa          | 1.43%  | 1.60%  | 5.61%  | 64.80% | 4.20%  | 2.88%  | 6.15%        | 13.33% |
| Ba           | 0.55%  | 0.55%  | 2.44%  | 6.37%  | 61.39% | 3.20%  | 12.73%       | 12.77% |
| B            | 0.06%  |        | 0.26%  | 1.68%  | 1.55%  | 65.25% | 16.28%       | 14.92% |
| Caa or below |        |        |        |        | 0.54%  | 0.72%  | 71.89%       | 26.85% |
| 4-year       | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
| Aaa          | 61.57% | 1.21%  | 0.37%  | 0.16%  | 0.04%  | 0.03%  | 0.22%        | 36.41% |
| Aa           | 19.68% | 49.13% | 3.85%  | 1.74%  | 0.71%  | 0.43%  | 0.51%        | 23.96% |
| A            | 5.13%  | 6.72%  | 52.98% | 1.88%  | 0.95%  | 0.54%  | 1.20%        | 30.61% |
| Baa          | 2.26%  | 2.27%  | 7.11%  | 55.90% | 4.46%  | 2.68%  | 7.25%        | 18.07% |
| Ba           | 0.89%  | 0.85%  | 3.80%  | 8.87%  | 51.64% | 2.77%  | 12.63%       | 18.54% |
| B            | 0.17%  |        | 0.35%  | 2.54%  | 2.19%  | 56.69% | 16.89%       | 21.17% |
| Caa or below |        |        |        |        | 1.03%  | 1.03%  | 65.37%       | 32.56% |
| 5-year       | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
| Aaa          | 52.66% | 1.10%  | 0.35%  | 0.14%  | 0.01%  | 0.03%  | 0.23%        | 45.48% |
| Aa           | 22.83% | 39.43% | 3.53%  | 1.67%  | 0.60%  | 0.50%  | 0.76%        | 30.68% |
| A            | 6.82%  | 7.26%  | 42.42% | 1.64%  | 0.90%  | 0.44%  | 1.14%        | 39.38% |
| Baa          | 3.14%  | 2.87%  | 8.83%  | 48.22% | 3.71%  | 2.48%  | 8.39%        | 22.36% |
| Ba           | 1.14%  | 1.27%  | 5.21%  | 10.86% | 43.75% | 2.22%  | 11.24%       | 24.32% |
| B            | 0.25%  |        | 0.37%  | 3.60%  | 2.36%  | 48.64% | 16.00%       | 28.78% |
| Caa or below |        |        |        |        | 1.72%  | 1.29%  | 59.23%       | 37.77% |

**Figure 65 – ABS Rating Transition Matrices (Weighted Averages, 1983-2003)**

| <b>1-year</b>       | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa or below</b> | <b>WR</b> |
|---------------------|------------|-----------|----------|------------|-----------|----------|---------------------|-----------|
| <b>Aaa</b>          | 89.16%     | 0.76%     | 0.22%    | 0.09%      | 0.02%     | 0.01%    | 0.07%               | 9.68%     |
| <b>Aa</b>           | 2.44%      | 87.69%    | 2.09%    | 1.10%      | 0.40%     | 0.09%    | 0.26%               | 5.93%     |
| <b>A</b>            | 0.67%      | 0.94%     | 88.73%   | 1.77%      | 0.82%     | 0.40%    | 0.15%               | 6.53%     |
| <b>Baa</b>          | 0.53%      | 0.30%     | 0.83%    | 86.25%     | 4.62%     | 1.85%    | 1.69%               | 3.93%     |
| <b>Ba</b>           | 0.25%      | 0.17%     | 0.33%    | 4.58%      | 73.61%    | 4.91%    | 12.74%              | 3.41%     |
| <b>B</b>            |            |           | 0.29%    | 0.59%      | 0.88%     | 71.26%   | 24.34%              | 2.64%     |
| <b>Caa or below</b> |            |           |          |            |           |          | 88.57%              | 11.43%    |
| <b>2-year</b>       | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa or below</b> | <b>WR</b> |
| <b>Aaa</b>          | 76.35%     | 1.19%     | 0.27%    | 0.15%      | 0.06%     | 0.05%    | 0.12%               | 21.82%    |
| <b>Aa</b>           | 4.49%      | 75.93%    | 2.89%    | 1.51%      | 0.86%     | 0.55%    | 0.61%               | 13.16%    |
| <b>A</b>            | 1.44%      | 1.67%     | 77.98%   | 2.02%      | 0.92%     | 0.54%    | 0.68%               | 14.76%    |
| <b>Baa</b>          | 1.21%      | 0.60%     | 1.43%    | 75.47%     | 6.62%     | 2.61%    | 3.85%               | 8.21%     |
| <b>Ba</b>           | 0.55%      | 0.44%     | 0.78%    | 0.78%      | 60.58%    | 5.32%    | 23.48%              | 8.08%     |
| <b>B</b>            | 0.41%      |           | 0.82%    | 1.23%      | 1.23%     | 61.48%   | 25.82%              | 9.02%     |
| <b>Caa or below</b> |            |           |          |            |           |          | 67.26%              | 32.74%    |
| <b>3-year</b>       | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa or below</b> | <b>WR</b> |
| <b>Aaa</b>          | 61.88%     | 1.19%     | 0.25%    | 0.19%      | 0.05%     | 0.05%    | 0.11%               | 36.29%    |
| <b>Aa</b>           | 6.59%      | 65.17%    | 3.11%    | 1.45%      | 0.93%     | 0.81%    | 0.57%               | 21.37%    |
| <b>A</b>            | 1.65%      | 1.87%     | 66.49%   | 1.73%      | 0.98%     | 0.55%    | 1.04%               | 25.69%    |
| <b>Baa</b>          | 1.21%      | 0.78%     | 1.69%    | 64.48%     | 7.20%     | 3.38%    | 6.94%               | 14.31%    |
| <b>Ba</b>           | 1.08%      | 0.93%     | 1.08%    | 1.39%      | 53.70%    | 4.01%    | 23.46%              | 14.35%    |
| <b>B</b>            | 0.56%      |           | 1.69%    | 1.69%      | 1.69%     | 51.98%   | 25.42%              | 16.95%    |
| <b>Caa or below</b> |            |           |          |            |           |          | 49.18%              | 50.82%    |
| <b>4-year</b>       | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa or below</b> | <b>WR</b> |
| <b>Aaa</b>          | 47.39%     | 0.96%     | 0.25%    | 0.19%      | 0.03%     | 0.02%    | 0.08%               | 51.09%    |
| <b>Aa</b>           | 8.60%      | 53.85%    | 2.97%    | 1.27%      | 0.96%     | 1.01%    | 0.32%               | 31.01%    |
| <b>A</b>            | 1.92%      | 2.08%     | 54.98%   | 1.31%      | 0.88%     | 0.37%    | 1.07%               | 37.38%    |
| <b>Baa</b>          | 1.38%      | 1.14%     | 1.79%    | 54.01%     | 9.57%     | 3.65%    | 7.72%               | 20.75%    |
| <b>Ba</b>           | 1.60%      | 1.37%     | 1.37%    | 2.29%      | 39.82%    | 3.43%    | 26.32%              | 23.80%    |
| <b>B</b>            | 1.68%      |           | 2.52%    | 2.52%      | 2.52%     | 41.18%   | 21.85%              | 27.73%    |
| <b>Caa or below</b> |            |           |          |            |           |          | 33.33%              | 66.67%    |
| <b>5-year</b>       | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa or below</b> | <b>WR</b> |
| <b>Aaa</b>          | 34.41%     | 0.75%     | 0.24%    | 0.14%      | 0.02%     |          | 0.04%               | 64.41%    |
| <b>Aa</b>           | 9.62%      | 43.07%    | 2.51%    | 0.98%      | 0.70%     | 1.53%    | 0.21%               | 41.39%    |
| <b>A</b>            | 2.60%      | 1.88%     | 43.77%   | 0.76%      | 0.69%     | 0.22%    | 0.76%               | 49.33%    |
| <b>Baa</b>          | 1.95%      | 1.42%     | 1.50%    | 45.66%     | 8.85%     | 3.54%    | 9.56%               | 27.52%    |
| <b>Ba</b>           | 1.92%      | 1.28%     | 1.28%    | 2.56%      | 32.91%    | 2.24%    | 24.92%              | 32.91%    |
| <b>B</b>            | 2.70%      |           | 2.70%    | 4.05%      | 2.70%     | 36.49%   | 12.16%              | 39.19%    |
| <b>Caa or below</b> |            |           |          |            |           |          | 16.67%              | 83.33%    |



**Figure 66 – HEL Rating Transition Matrices (Weighted Averages, 1990-2003)**

| <b>1-year</b>       | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa or below</b> | <b>WR</b> |
|---------------------|------------|-----------|----------|------------|-----------|----------|---------------------|-----------|
| <b>Aaa</b>          | 95.72%     | 0.18%     |          |            |           |          |                     | 4.11%     |
| <b>Aa</b>           | 1.98%      | 95.11%    | 0.66%    |            |           |          |                     | 2.25%     |
| <b>A</b>            | 0.49%      | 1.54%     | 94.71%   | 1.05%      | 0.49%     | 0.06%    |                     | 1.66%     |
| <b>Baa</b>          | 0.13%      | 0.19%     | 1.01%    | 92.96%     | 2.89%     | 0.63%    | 1.13%               | 1.07%     |
| <b>Ba</b>           |            | 0.24%     | 0.73%    | 4.16%      | 86.06%    | 1.22%    | 6.36%               | 1.22%     |
| <b>B</b>            |            |           | 0.62%    | 1.23%      | 1.85%     | 87.65%   | 7.41%               | 1.23%     |
| <b>Caa or below</b> |            |           |          |            |           |          | 84.09%              | 15.91%    |
| <b>2-year</b>       | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa or below</b> | <b>WR</b> |
| <b>Aaa</b>          | 89.00%     | 0.33%     |          |            |           |          |                     | 10.67%    |
| <b>Aa</b>           | 3.88%      | 88.94%    | 1.10%    |            |           |          |                     | 6.08%     |
| <b>A</b>            | 1.09%      | 2.91%     | 88.08%   | 2.37%      | 1.00%     | 0.09%    | 0.09%               | 4.37%     |
| <b>Baa</b>          | 0.31%      | 0.51%     | 1.73%    | 86.16%     | 5.80%     | 1.42%    | 1.93%               | 2.14%     |
| <b>Ba</b>           | 0.33%      | 0.65%     | 1.63%    | 0.65%      | 77.12%    | 2.94%    | 13.07%              | 3.59%     |
| <b>B</b>            | 0.76%      |           | 1.53%    | 2.29%      | 2.29%     | 76.34%   | 10.69%              | 6.11%     |
| <b>Caa or below</b> |            |           |          |            |           |          | 70.37%              | 29.63%    |
| <b>3-year</b>       | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa or below</b> | <b>WR</b> |
| <b>Aaa</b>          | 79.33%     | 0.19%     |          |            |           |          |                     | 20.48%    |
| <b>Aa</b>           | 5.79%      | 81.28%    | 1.49%    |            |           |          |                     | 11.44%    |
| <b>A</b>            | 1.87%      | 4.13%     | 79.33%   | 3.60%      | 1.60%     | 0.40%    | 0.40%               | 8.67%     |
| <b>Baa</b>          | 0.62%      | 0.78%     | 2.49%    | 76.52%     | 8.55%     | 2.95%    | 4.35%               | 3.73%     |
| <b>Ba</b>           | 0.47%      | 1.42%     | 2.37%    | 0.95%      | 69.67%    | 2.84%    | 17.06%              | 5.21%     |
| <b>B</b>            | 0.99%      |           | 2.97%    | 2.97%      | 2.97%     | 63.37%   | 13.86%              | 12.87%    |
| <b>Caa or below</b> |            |           |          |            |           |          | 58.33%              | 41.67%    |
| <b>4-year</b>       | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa or below</b> | <b>WR</b> |
| <b>Aaa</b>          | 68.43%     | 0.27%     |          |            |           |          |                     | 31.30%    |
| <b>Aa</b>           | 7.67%      | 71.56%    | 1.35%    | 0.23%      |           |          |                     | 19.19%    |
| <b>A</b>            | 2.92%      | 5.64%     | 69.26%   | 3.70%      | 2.33%     | 0.39%    | 0.78%               | 14.98%    |
| <b>Baa</b>          | 1.19%      | 1.19%     | 3.33%    | 65.56%     | 12.11%    | 4.75%    | 5.94%               | 5.94%     |
| <b>Ba</b>           | 1.45%      | 2.17%     | 3.62%    | 1.45%      | 58.70%    | 2.90%    | 21.01%              | 8.70%     |
| <b>B</b>            | 2.78%      |           | 4.17%    | 4.17%      | 4.17%     | 51.39%   | 15.28%              | 18.06%    |
| <b>Caa or below</b> |            |           |          |            |           |          | 33.33%              | 66.67%    |
| <b>5-year</b>       | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa or below</b> | <b>WR</b> |
| <b>Aaa</b>          | 56.59%     | 0.19%     |          |            |           |          |                     | 43.22%    |
| <b>Aa</b>           | 8.54%      | 58.01%    | 1.78%    | 0.36%      |           |          |                     | 31.32%    |
| <b>A</b>            | 4.34%      | 5.78%     | 56.07%   | 3.18%      | 2.60%     | 1.16%    | 1.45%               | 25.43%    |
| <b>Baa</b>          | 1.67%      | 2.08%     | 4.17%    | 55.42%     | 13.75%    | 5.42%    | 7.92%               | 9.58%     |
| <b>Ba</b>           | 2.17%      | 2.17%     | 4.35%    | 1.09%      | 54.35%    | 3.26%    | 18.48%              | 14.13%    |
| <b>B</b>            | 4.35%      |           | 4.35%    | 6.52%      | 4.35%     | 45.65%   | 13.04%              | 21.74%    |
| <b>Caa or below</b> |            |           |          |            |           |          |                     | 100.00%   |

**Figure 67 – CDO Rating Transition Matrices (Weighted Averages, 1991-2003)**

| 1-year       | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
|--------------|--------|--------|--------|--------|--------|--------|--------------|--------|
| Aaa          | 88.65% | 3.82%  | 1.04%  | 0.55%  | 0.05%  | 0.05%  |              | 5.84%  |
| Aa           | 0.53%  | 83.79% | 6.60%  | 3.14%  | 0.87%  | 0.33%  | 0.07%        | 4.67%  |
| A            | 0.08%  | 1.15%  | 81.20% | 6.84%  | 2.47%  | 0.82%  | 0.74%        | 6.68%  |
| Baa          |        | 0.10%  | 0.61%  | 80.73% | 6.95%  | 3.96%  | 2.89%        | 4.77%  |
| Ba           |        |        |        | 1.05%  | 77.79% | 7.15%  | 10.39%       | 3.62%  |
| B            |        |        |        | 0.54%  | 0.54%  | 67.85% | 27.79%       | 3.27%  |
| Caa or below |        |        |        |        |        |        | 94.38%       | 5.62%  |
| 2-year       | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
| Aaa          | 74.37% | 6.26%  | 2.52%  | 1.65%  | 0.35%  | 0.26%  | 0.09%        | 14.51% |
| Aa           | 0.99%  | 69.13% | 8.19%  | 6.71%  | 2.76%  | 1.18%  | 0.69%        | 10.36% |
| A            | 0.13%  | 2.28%  | 62.68% | 6.71%  | 4.83%  | 2.01%  | 2.95%        | 18.39% |
| Baa          |        | 0.15%  | 0.90%  | 62.47% | 8.09%  | 6.44%  | 10.79%       | 11.16% |
| Ba           |        |        |        | 2.08%  | 59.35% | 8.16%  | 23.00%       | 7.42%  |
| B            |        |        |        |        |        | 50.00% | 41.54%       | 8.46%  |
| Caa or below |        |        |        |        |        |        | 92.86%       | 7.14%  |
| 3-year       | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
| Aaa          | 57.29% | 7.89%  | 3.57%  | 2.08%  | 0.60%  | 0.45%  | 0.15%        | 27.98% |
| Aa           | 1.47%  | 56.78% | 8.55%  | 9.29%  | 3.83%  | 1.47%  | 1.47%        | 17.11% |
| A            |        | 3.31%  | 45.47% | 3.75%  | 4.42%  | 2.65%  | 4.42%        | 35.98% |
| Baa          |        |        | 0.59%  | 47.64% | 7.55%  | 8.73%  | 17.22%       | 18.28% |
| Ba           |        |        |        | 3.14%  | 42.93% | 5.50%  | 34.82%       | 13.61% |
| B            |        |        |        |        |        | 41.24% | 47.46%       | 11.30% |
| Caa or below |        |        |        |        |        |        | 85.71%       | 14.29% |
| 4-year       | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
| Aaa          | 38.96% | 5.72%  | 3.27%  | 2.45%  | 0.27%  | 0.82%  | 0.27%        | 48.23% |
| Aa           | 1.34%  | 47.20% | 10.29% | 8.95%  | 3.80%  | 1.57%  | 2.46%        | 24.38% |
| A            |        | 4.10%  | 28.73% | 1.49%  | 2.24%  | 2.61%  | 4.85%        | 55.97% |
| Baa          |        |        | 0.39%  | 37.02% | 6.59%  | 7.95%  | 20.93%       | 27.13% |
| Ba           |        |        |        | 3.63%  | 32.12% | 3.63%  | 36.79%       | 23.83% |
| B            |        |        |        |        |        | 33.33% | 50.93%       | 15.74% |
| Caa or below |        |        |        |        |        |        | 80.00%       | 20.00% |
| 5-year       | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
| Aaa          | 24.61% | 1.05%  |        | 1.05%  |        | 0.52%  | 0.52%        | 72.25% |
| Aa           | 0.70%  | 40.21% | 11.19% | 7.69%  | 3.50%  | 1.05%  | 2.45%        | 33.22% |
| A            |        | 3.75%  | 16.25% | 0.63%  | 1.25%  | 2.50%  | 1.25%        | 74.38% |
| Baa          |        |        | 0.34%  | 27.40% | 7.19%  | 6.85%  | 21.58%       | 36.64% |
| Ba           |        |        |        | 2.56%  | 30.77% | 3.85%  | 25.64%       | 37.18% |
| B            |        |        |        |        |        | 21.57% | 54.90%       | 23.53% |
| Caa or below |        |        |        |        |        |        | 50.00%       | 50.00% |

**Figure 68 – CMBS Rating Transition Matrices (Weighted Averages, 1988-2003)**

| <b>1-year</b>       | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa or below</b> | <b>WR</b> |
|---------------------|------------|-----------|----------|------------|-----------|----------|---------------------|-----------|
| <b>Aaa</b>          | 91.21%     | 1.13%     | 0.04%    |            |           |          |                     | 7.62%     |
| <b>Aa</b>           | 6.08%      | 85.50%    | 0.94%    | 0.21%      |           | 0.10%    | 0.05%               | 7.12%     |
| <b>A</b>            | 1.15%      | 3.23%     | 88.48%   | 1.41%      | 0.26%     |          |                     | 5.47%     |
| <b>Baa</b>          | 0.35%      | 0.82%     | 2.35%    | 86.94%     | 2.27%     | 0.39%    | 0.12%               | 6.77%     |
| <b>Ba</b>           |            |           | 0.57%    | 2.11%      | 90.81%    | 2.03%    | 0.49%               | 3.98%     |
| <b>B</b>            | 0.19%      |           | 0.09%    | 0.57%      | 1.14%     | 92.13%   | 3.51%               | 2.37%     |
| <b>Caa or below</b> |            |           |          |            |           | 2.36%    | 92.13%              | 5.51%     |
| <b>2-year</b>       | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa or below</b> | <b>WR</b> |
| <b>Aaa</b>          | 84.29%     | 1.60%     | 0.22%    |            |           |          |                     | 13.88%    |
| <b>Aa</b>           | 8.71%      | 72.20%    | 1.24%    | 0.48%      | 0.35%     | 0.07%    | 0.14%               | 16.80%    |
| <b>A</b>            | 1.90%      | 5.32%     | 76.82%   | 2.04%      | 0.95%     | 0.07%    | 0.07%               | 12.83%    |
| <b>Baa</b>          | 0.97%      | 1.65%     | 4.45%    | 74.57%     | 3.02%     | 0.80%    | 0.34%               | 14.20%    |
| <b>Ba</b>           |            | 0.37%     | 1.12%    | 3.35%      | 81.49%    | 3.35%    | 1.37%               | 8.94%     |
| <b>B</b>            |            |           | 0.14%    | 1.27%      | 2.11%     | 83.68%   | 6.19%               | 6.61%     |
| <b>Caa or below</b> |            |           |          |            |           | 4.88%    | 85.37%              | 9.76%     |
| <b>3-year</b>       | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa or below</b> | <b>WR</b> |
| <b>Aaa</b>          | 78.60%     | 1.43%     | 0.48%    |            |           |          |                     | 19.49%    |
| <b>Aa</b>           | 12.12%     | 58.59%    | 1.01%    | 0.83%      | 0.83%     | 0.09%    | 0.37%               | 26.17%    |
| <b>A</b>            | 2.45%      | 7.36%     | 65.99%   | 2.13%      | 1.39%     | 0.11%    |                     | 20.58%    |
| <b>Baa</b>          | 1.41%      | 2.38%     | 7.04%    | 65.32%     | 2.46%     | 0.88%    | 0.53%               | 19.98%    |
| <b>Ba</b>           |            | 1.34%     | 0.57%    | 4.40%      | 68.83%    | 4.40%    | 2.29%               | 18.16%    |
| <b>B</b>            |            |           | 0.21%    | 1.50%      | 2.78%     | 72.38%   | 9.42%               | 13.70%    |
| <b>Caa or below</b> |            |           |          |            |           | 6.90%    | 77.59%              | 15.52%    |
| <b>4-year</b>       | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa or below</b> | <b>WR</b> |
| <b>Aaa</b>          | 70.94%     | 1.53%     | 0.82%    |            |           |          |                     | 26.71%    |
| <b>Aa</b>           | 14.91%     | 45.97%    | 0.49%    | 0.86%      | 1.47%     |          | 0.49%               | 35.82%    |
| <b>A</b>            | 3.32%      | 9.02%     | 54.59%   | 2.06%      | 1.58%     |          |                     | 29.43%    |
| <b>Baa</b>          | 2.54%      | 3.07%     | 8.56%    | 55.21%     | 2.14%     | 0.67%    | 0.40%               | 27.41%    |
| <b>Ba</b>           |            | 2.07%     | 0.30%    | 5.92%      | 53.25%    | 4.73%    | 3.25%               | 30.47%    |
| <b>B</b>            |            |           | 0.34%    | 2.36%      | 4.38%     | 60.61%   | 10.44%              | 21.89%    |
| <b>Caa or below</b> |            |           |          |            |           | 10.26%   | 64.10%              | 25.64%    |
| <b>5-year</b>       | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa or below</b> | <b>WR</b> |
| <b>Aaa</b>          | 63.13%     | 1.86%     | 1.30%    | 0.19%      |           |          |                     | 33.52%    |
| <b>Aa</b>           | 17.25%     | 33.83%    | 0.66%    | 0.66%      | 1.99%     |          | 0.66%               | 44.94%    |
| <b>A</b>            | 5.05%      | 10.58%    | 41.83%   | 2.16%      | 2.40%     |          | 0.24%               | 37.74%    |
| <b>Baa</b>          | 4.23%      | 4.02%     | 11.21%   | 43.13%     | 1.06%     | 0.42%    | 0.63%               | 35.31%    |
| <b>Ba</b>           |            | 3.77%     |          | 4.72%      | 35.85%    | 4.25%    | 2.83%               | 48.58%    |
| <b>B</b>            |            |           | 0.57%    | 3.43%      | 5.14%     | 46.29%   | 9.71%               | 34.86%    |
| <b>Caa or below</b> |            |           |          |            |           | 13.64%   | 45.45%              | 40.91%    |

**Figure 69 – RMBS Rating Transition Matrices (Weighted Averages, 1983-2003)**

| <b>1-year</b>       | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa or below</b> | <b>WR</b> |
|---------------------|------------|-----------|----------|------------|-----------|----------|---------------------|-----------|
| <b>Aaa</b>          | 92.33%     | 0.46%     | 0.11%    | 0.02%      |           |          | 0.02%               | 7.06%     |
| <b>Aa</b>           | 6.87%      | 86.34%    | 1.87%    | 0.35%      | 0.02%     | 0.04%    |                     | 4.51%     |
| <b>A</b>            | 1.90%      | 3.91%     | 88.01%   | 1.95%      | 0.18%     | 0.03%    | 0.23%               | 3.78%     |
| <b>Baa</b>          | 0.59%      | 0.65%     | 3.08%    | 89.97%     | 1.87%     | 0.78%    | 0.84%               | 2.22%     |
| <b>Ba</b>           | 0.19%      |           | 1.27%    | 3.80%      | 87.67%    | 1.83%    | 2.66%               | 2.59%     |
| <b>B</b>            |            |           |          | 0.47%      | 0.47%     | 88.03%   | 6.81%               | 4.23%     |
| <b>Caa or below</b> |            |           |          |            | 0.19%     |          | 88.25%              | 11.56%    |
| <b>2-year</b>       | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa or below</b> | <b>WR</b> |
| <b>Aaa</b>          | 84.33%     | 0.75%     | 0.20%    | 0.05%      |           |          | 0.09%               | 14.58%    |
| <b>Aa</b>           | 13.16%     | 72.78%    | 3.02%    | 0.88%      | 0.10%     | 0.04%    | 0.08%               | 9.94%     |
| <b>A</b>            | 4.32%      | 7.69%     | 75.23%   | 2.26%      | 0.82%     | 0.21%    | 0.39%               | 9.08%     |
| <b>Baa</b>          | 1.22%      | 1.54%     | 6.68%    | 78.86%     | 1.89%     | 1.49%    | 2.35%               | 5.97%     |
| <b>Ba</b>           | 0.38%      | 0.06%     | 2.72%    | 8.03%      | 75.71%    | 1.77%    | 4.68%               | 6.64%     |
| <b>B</b>            |            |           |          | 1.53%      | 1.53%     | 76.64%   | 8.92%               | 11.38%    |
| <b>Caa or below</b> |            |           |          |            | 0.39%     |          | 81.12%              | 18.50%    |
| <b>3-year</b>       | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa or below</b> | <b>WR</b> |
| <b>Aaa</b>          | 76.74%     | 1.00%     | 0.30%    | 0.09%      | 0.01%     |          | 0.20%               | 21.66%    |
| <b>Aa</b>           | 18.70%     | 60.07%    | 3.68%    | 1.33%      | 0.37%     | 0.12%    | 0.18%               | 15.55%    |
| <b>A</b>            | 7.36%      | 10.37%    | 63.56%   | 2.49%      | 0.73%     | 0.58%    | 0.91%               | 13.99%    |
| <b>Baa</b>          | 1.98%      | 2.36%     | 9.34%    | 69.47%     | 1.72%     | 1.66%    | 4.62%               | 8.86%     |
| <b>Ba</b>           | 0.67%      | 0.22%     | 4.51%    | 10.42%     | 67.41%    | 1.70%    | 5.40%               | 9.68%     |
| <b>B</b>            |            |           |          | 2.20%      | 1.10%     | 69.74%   | 10.87%              | 16.09%    |
| <b>Caa or below</b> |            |           |          |            | 0.71%     |          | 73.93%              | 25.36%    |
| <b>4-year</b>       | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa or below</b> | <b>WR</b> |
| <b>Aaa</b>          | 69.28%     | 1.18%     | 0.32%    | 0.08%      | 0.03%     | 0.01%    | 0.31%               | 28.78%    |
| <b>Aa</b>           | 23.64%     | 48.48%    | 4.03%    | 1.55%      | 0.41%     | 0.28%    | 0.44%               | 21.18%    |
| <b>A</b>            | 10.32%     | 12.64%    | 52.25%   | 2.64%      | 0.79%     | 0.68%    | 1.29%               | 19.39%    |
| <b>Baa</b>          | 3.16%      | 3.19%     | 11.29%   | 60.88%     | 1.52%     | 1.63%    | 6.24%               | 12.07%    |
| <b>Ba</b>           | 1.03%      | 0.43%     | 6.37%    | 13.08%     | 58.86%    | 1.81%    | 6.20%               | 12.22%    |
| <b>B</b>            |            |           |          | 3.07%      | 1.45%     | 61.87%   | 13.09%              | 20.52%    |
| <b>Caa or below</b> |            |           |          |            | 1.28%     |          | 68.37%              | 30.35%    |
| <b>5-year</b>       | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa or below</b> | <b>WR</b> |
| <b>Aaa</b>          | 61.74%     | 1.23%     | 0.36%    | 0.12%      | 0.01%     | 0.04%    | 0.33%               | 36.16%    |
| <b>Aa</b>           | 26.58%     | 39.16%    | 3.65%    | 1.66%      | 0.37%     | 0.33%    | 0.81%               | 27.45%    |
| <b>A</b>            | 12.59%     | 13.27%    | 42.72%   | 2.65%      | 0.85%     | 0.64%    | 1.75%               | 25.52%    |
| <b>Baa</b>          | 3.91%      | 3.73%     | 13.11%   | 53.27%     | 1.24%     | 1.82%    | 7.73%               | 15.19%    |
| <b>Ba</b>           | 1.23%      | 0.82%     | 8.02%    | 15.53%     | 50.00%    | 1.65%    | 7.51%               | 15.23%    |
| <b>B</b>            |            |           |          | 3.95%      | 1.58%     | 53.95%   | 14.82%              | 25.69%    |
| <b>Caa or below</b> |            |           |          |            | 1.97%     |          | 62.07%              | 35.96%    |

**Figure 70 – All Structured Finance Refined Rating One-Year Transition Matrix in 2003**

|             | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3   | Caa1  | Caa2  | Caa3  | Ca    | C     | WR    |
|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|
| <b>Aaa</b>  | 6507  | 91.1% | 0.4%  | 0.3%  | 0.3%  | 0.2%  | 0.1%  | 0.2%  | 0.1%  | 0.1%  | 0.0%  |       | 0.0%  |       |       |       |      |       |       |       |       |       | 7.2%  |
| <b>Aa1</b>  | 345   | 6.4%  | 74.8% | 1.2%  | 1.4%  | 1.4%  | 0.6%  | 0.3%  | 0.6%  | 0.3%  | 0.6%  |       |       |       |       | 0.3%  |      |       |       |       |       |       | 12.2% |
| <b>Aa2</b>  | 1860  | 5.1%  | 0.8%  | 85.4% | 1.1%  | 0.9%  | 0.8%  | 0.6%  | 0.2%  | 0.2%  | 0.2%  | 0.2%  | 0.1%  | 0.1%  | 0.1%  |       |      | 0.1%  |       |       |       |       | 4.4%  |
| <b>Aa3</b>  | 613   | 2.6%  | 1.8%  | 1.5%  | 73.9% | 1.6%  | 1.8%  | 3.3%  | 1.8%  | 2.0%  | 0.5%  | 0.8%  | 0.3%  | 0.5%  | 0.2%  | 0.3%  |      |       |       |       |       |       | 7.2%  |
| <b>A1</b>   | 653   | 2.1%  | 0.8%  | 2.0%  | 0.3%  | 76.4% | 1.1%  | 0.9%  | 1.5%  | 4.6%  | 0.6%  | 0.3%  | 0.2%  | 0.3%  |       | 0.2%  | 0.2% | 0.2%  |       |       |       |       | 8.4%  |
| <b>A2</b>   | 2231  | 0.3%  | 0.4%  | 2.2%  | 0.8%  | 0.9%  | 85.7% | 0.7%  | 0.6%  | 0.7%  | 0.5%  | 0.4%  | 0.5%  | 0.4%  | 0.3%  | 0.1%  | 0.3% | 0.0%  | 0.0%  | 0.1%  |       |       | 5.1%  |
| <b>A3</b>   | 705   | 0.3%  |       | 0.3%  | 1.7%  | 0.4%  | 1.1%  | 79.9% | 1.4%  | 2.1%  | 2.4%  | 1.1%  | 0.7%  | 0.7%  | 0.6%  | 0.7%  | 0.7% |       | 0.3%  |       | 0.1%  |       | 5.4%  |
| <b>Baa1</b> | 431   |       |       |       |       | 0.7%  | 1.4%  | 1.2%  | 78.0% | 0.9%  | 2.1%  | 2.8%  | 0.5%  | 0.5%  | 1.9%  | 0.2%  | 0.7% | 0.9%  |       |       | 0.2%  | 0.2%  | 7.9%  |
| <b>Baa2</b> | 1985  | 0.5%  |       | 0.2%  | 0.3%  | 0.3%  | 2.4%  | 0.6%  | 1.0%  | 81.5% | 1.7%  | 0.9%  | 1.1%  | 0.8%  | 0.7%  | 1.1%  | 0.6% | 0.3%  | 0.3%  | 0.3%  | 0.6%  | 0.4%  | 4.8%  |
| <b>Baa3</b> | 980   | 0.1%  |       | 0.1%  |       | 0.2%  |       | 0.9%  | 0.8%  | 0.9%  | 78.2% | 1.3%  | 1.5%  | 1.8%  | 1.0%  | 0.4%  | 0.6% | 0.6%  | 0.1%  | 0.5%  | 1.3%  | 0.4%  | 9.1%  |
| <b>Ba1</b>  | 276   |       |       |       |       |       |       | 0.4%  | 0.4%  | 1.1%  | 0.4%  | 77.5% | 1.1%  | 1.4%  | 2.9%  | 1.4%  | 0.7% | 2.2%  | 1.1%  | 0.7%  | 1.8%  | 1.1%  | 5.8%  |
| <b>Ba2</b>  | 750   | 0.1%  |       |       | 0.1%  |       |       | 0.3%  | 0.3%  | 3.3%  | 0.5%  | 0.5%  | 80.3% | 1.3%  | 1.1%  | 1.3%  | 0.8% | 1.5%  | 0.7%  | 0.8%  | 0.9%  | 2.4%  | 3.7%  |
| <b>Ba3</b>  | 387   |       |       |       |       |       |       |       |       | 0.3%  | 1.8%  | 0.5%  | 0.3%  | 73.4% | 1.8%  | 1.3%  | 3.6% | 2.6%  | 2.1%  | 0.8%  | 3.9%  | 3.1%  | 4.7%  |
| <b>B1</b>   | 167   | 0.6%  |       |       |       |       |       |       |       |       | 0.6%  |       |       |       | 68.3% | 3.6%  | 4.8% | 1.2%  | 1.2%  | 2.4%  | 3.0%  | 9.6%  | 4.8%  |
| <b>B2</b>   | 369   | 0.3%  |       |       |       |       |       |       |       |       | 1.4%  | 0.5%  | 4.3%  | 1.9%  | 0.3%  | 78.3% | 2.2% | 1.9%  | 2.2%  | 0.3%  | 0.8%  | 3.5%  | 2.2%  |
| <b>B3</b>   | 197   |       |       |       |       |       |       |       |       |       | 0.5%  |       |       | 0.5%  | 0.5%  | 75.1% | 4.6% | 3.6%  | 3.6%  | 5.1%  | 3.0%  | 3.0%  |       |
| <b>Caa1</b> | 73    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      | 61.6% | 2.7%  | 6.8%  | 13.7% | 13.7% | 1.4%  |
| <b>Caa2</b> | 101   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 1.0% |       | 65.3% | 5.9%  | 13.9% | 12.9% | 1.0%  |
| <b>Caa3</b> | 74    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       | 56.8% | 13.5% | 18.9% | 10.8% |
| <b>Ca</b>   | 127   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       | 76.4% | 18.9% | 4.7%  |
| <b>C</b>    | 116   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |       | 93.1% | 6.9%  |

Figure 71 – ABS Refined Rating One-Year Transition Matrix in 2003

|             | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1  | Caa2  | Caa3  | Ca    | C     | WR    |
|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| <b>Aaa</b>  | 2399  | 90.3% | 0.2%  | 0.3%  | 0.6%  | 0.2%  | 0.3%  | 0.5%  | 0.2%  | 0.2%  | 0.1%  |       | 0.1%  |       |       |       |       |       |       |       |       |       | 7.2%  |
| <b>Aa1</b>  | 73    | 2.7%  | 75.3% |       | 1.4%  | 2.7%  | 1.4%  |       | 1.4%  |       | 2.7%  |       |       |       |       | 1.4%  |       |       |       |       |       |       | 11.0% |
| <b>Aa2</b>  | 695   | 3.9%  |       | 88.1% | 0.4%  | 1.2%  | 1.4%  | 0.4%  |       | 0.6%  | 0.3%  | 0.6%  | 0.1%  | 0.1%  |       |       |       |       |       |       |       |       | 2.9%  |
| <b>Aa3</b>  | 243   | 1.2%  |       |       | 68.7% | 1.2%  | 1.2%  | 3.7%  | 2.9%  | 4.5%  | 0.4%  | 1.6%  | 0.8%  | 1.2%  | 0.4%  | 0.8%  |       |       |       |       |       |       | 11.1% |
| <b>A1</b>   | 353   | 2.8%  | 0.3%  | 0.3%  |       | 75.6% | 0.8%  | 0.3%  | 0.6%  | 8.2%  | 0.6%  |       | 0.3%  |       |       | 0.3%  | 0.3%  | 0.3%  |       |       |       |       | 9.3%  |
| <b>A2</b>   | 1206  | 0.2%  | 0.2%  | 1.0%  | 0.3%  | 0.1%  | 87.1% | 0.3%  | 0.7%  | 1.2%  | 0.7%  | 0.4%  | 0.8%  | 0.8%  | 0.6%  | 0.2%  | 0.6%  | 0.1%  | 0.1%  | 0.1%  |       |       | 4.6%  |
| <b>A3</b>   | 190   |       |       |       |       |       | 0.5%  | 71.6% | 0.5%  | 3.2%  | 4.2%  | 1.1%  | 0.5%  | 2.1%  | 1.1%  | 1.6%  | 2.6%  |       | 1.1%  |       |       |       | 10.0% |
| <b>Baa1</b> | 130   |       |       |       |       |       | 0.8%  | 0.8%  | 79.2% |       | 0.8%  | 1.5%  |       | 0.8%  | 3.8%  | 0.8%  | 2.3%  | 2.3%  |       |       |       | 0.8%  | 6.2%  |
| <b>Baa2</b> | 768   | 0.9%  |       | 0.1%  |       | 0.3%  | 1.2%  |       | 0.1%  | 83.5% | 0.9%  | 0.3%  | 1.6%  | 0.9%  | 1.0%  | 1.3%  | 0.8%  | 0.5%  | 0.3%  | 0.4%  | 1.4%  | 0.9%  | 3.6%  |
| <b>Baa3</b> | 286   | 0.3%  |       |       |       |       |       |       | 0.3%  | 0.3%  | 79.0% | 1.0%  | 0.7%  | 1.0%  | 0.7%  | 1.4%  | 1.4%  | 0.7%  | 0.3%  | 1.4%  | 4.2%  | 1.0%  | 5.9%  |
| <b>Ba1</b>  | 53    |       |       |       |       |       |       |       |       |       |       | 75.5% |       |       |       | 3.8%  | 1.9%  | 7.5%  |       |       | 5.7%  | 5.7%  |       |
| <b>Ba2</b>  | 180   | 0.6%  |       |       |       |       |       |       | 0.6%  | 0.6%  |       |       | 72.8% |       | 0.6%  | 1.1%  | 1.1%  | 3.9%  | 1.7%  | 2.2%  | 2.8%  | 9.4%  | 2.8%  |
| <b>Ba3</b>  | 65    |       |       |       |       |       |       |       |       |       |       |       |       | 52.3% | 1.5%  | 1.5%  | 7.7%  | 4.6%  | 1.5%  | 1.5%  | 9.2%  | 15.4% | 4.6%  |
| <b>B1</b>   | 25    |       |       |       |       |       |       |       |       |       |       |       |       |       | 20.0% |       | 8.0%  |       | 4.0%  |       | 8.0%  | 56.0% | 4.0%  |
| <b>B2</b>   | 56    |       |       |       |       |       |       |       |       |       |       |       |       | 5.4%  |       | 62.5% |       | 7.1%  | 3.6%  |       | 1.8%  | 19.6% |       |
| <b>B3</b>   | 16    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 43.8% | 6.3%  |       | 6.3%  | 12.5% | 31.3% |       |
| <b>Caa1</b> | 15    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 33.3% | 6.7%  |       | 20.0% | 40.0% |       |
| <b>Caa2</b> | 32    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 59.4% | 3.1%  | 18.8% | 18.8% |       |
| <b>Caa3</b> | 31    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 58.1% | 6.5%  | 22.6% | 12.9% |
| <b>Ca</b>   | 49    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 59.2% | 32.7% | 8.2%  |
| <b>C</b>    | 40    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 95.0% | 5.0%  |

**Figure 72 – CDO Refined Rating One-Year Transition Matrix in 2003**

|             | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2  | Ba3   | B1    | B2    | B3    | Caa1  | Caa2  | Caa3  | Ca    | C     | WR    |
|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| <b>Aaa</b>  | 681   | 89.6% | 2.8%  | 1.3%  | 0.9%  | 0.9%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  |       |       |      |       |       |       |       |       |       |       |       |       | 4.0%  |
| <b>Aa1</b>  | 87    |       | 78.2% | 4.6%  | 4.6%  | 3.4%  | 1.1%  | 1.1%  | 1.1%  | 1.1%  |       |       |      |       |       |       |       |       |       |       |       |       | 4.6%  |
| <b>Aa2</b>  | 279   | 0.7%  | 1.1%  | 79.9% | 4.7%  | 2.5%  | 1.4%  | 2.5%  | 1.1%  |       | 0.7%  |       |      |       | 0.4%  |       |       |       |       |       |       |       | 5.0%  |
| <b>Aa3</b>  | 119   | 0.8%  |       | 0.8%  | 68.9% | 5.0%  | 6.7%  | 5.0%  | 3.4%  | 0.8%  | 1.7%  | 0.8%  |      |       |       |       |       |       |       |       |       |       | 5.9%  |
| <b>A1</b>   | 95    |       | 1.1%  | 1.1%  | 1.1%  | 71.6% | 4.2%  | 4.2%  | 7.4%  | 1.1%  | 1.1%  | 2.1%  |      | 1.1%  |       |       |       |       |       |       |       |       | 4.2%  |
| <b>A2</b>   | 171   |       | 0.6%  | 1.2%  | 0.6%  | 1.8%  | 78.9% | 2.3%  | 2.3%  | 1.2%  | 1.8%  | 0.6%  | 1.2% |       |       |       |       |       |       | 0.6%  |       |       | 7.0%  |
| <b>A3</b>   | 202   |       |       |       | 0.5%  |       |       | 80.7% | 3.0%  | 3.5%  | 4.0%  | 3.0%  | 2.0% | 0.5%  | 1.0%  | 1.0%  |       |       |       |       | 0.5%  |       | 0.5%  |
| <b>Baa1</b> | 92    |       |       |       |       | 1.1%  | 1.1%  | 1.1%  | 71.7% | 3.3%  | 7.6%  | 6.5%  | 1.1% | 1.1%  | 1.1%  |       |       | 1.1%  |       |       |       |       | 3.3%  |
| <b>Baa2</b> | 376   |       |       | 0.3%  |       | 0.3%  | 0.3%  |       | 0.3%  | 78.2% | 5.1%  | 2.9%  | 2.1% | 1.6%  | 1.6%  | 2.1%  | 1.3%  | 0.3%  | 0.8%  | 0.8%  |       | 0.3%  | 1.9%  |
| <b>Baa3</b> | 169   |       |       |       |       |       |       | 0.6%  | 0.6%  | 1.2%  | 68.0% | 3.6%  | 4.7% | 6.5%  | 4.1%  |       | 1.2%  | 1.2%  |       | 0.6%  | 0.6%  | 0.6%  | 6.5%  |
| <b>Ba1</b>  | 71    |       |       |       |       |       |       |       | 1.4%  | 1.4%  |       | 59.2% | 1.4% | 4.2%  | 8.5%  | 2.8%  | 1.4%  | 1.4%  | 4.2%  | 2.8%  | 2.8%  |       | 8.5%  |
| <b>Ba2</b>  | 177   |       |       |       |       |       |       |       |       | 0.6%  | 0.6%  | 77.4% | 3.4% | 4.0%  | 3.4%  | 1.7%  | 1.1%  | 1.1%  | 1.1%  | 0.6%  |       |       | 5.1%  |
| <b>Ba3</b>  | 127   |       |       |       |       |       |       |       |       |       |       |       |      | 66.9% | 3.1%  | 1.6%  | 5.5%  | 3.9%  | 4.7%  | 1.6%  | 7.1%  | 1.6%  | 3.9%  |
| <b>B1</b>   | 34    |       |       |       |       |       |       |       |       |       |       |       |      |       | 44.1% | 11.8% | 14.7% | 2.9%  | 2.9%  | 8.8%  | 8.8%  | 5.9%  |       |
| <b>B2</b>   | 42    |       |       |       |       |       |       |       |       | 4.8%  | 4.8%  |       |      |       |       | 66.7% | 2.4%  | 2.4%  | 7.1%  | 2.4%  | 4.8%  |       | 4.8%  |
| <b>B3</b>   | 31    |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       | 51.6% | 9.7%  | 6.5%  | 12.9% | 16.1% |       | 3.2%  |
| <b>Caa1</b> | 21    |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |       | 28.6% |       | 23.8% | 28.6% | 14.3% | 4.8%  |
| <b>Caa2</b> | 28    |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |       |       | 50.0% | 10.7% | 17.9% | 17.9% | 3.6%  |
| <b>Caa3</b> | 29    |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |       |       |       | 44.8% | 27.6% | 17.2% | 10.3% |
| <b>Ca</b>   | 48    |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |       |       |       |       | 79.2% | 16.7% | 4.2%  |
| <b>C</b>    | 67    |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |       |       |       |       |       | 92.5% | 7.5%  |

Figure 73 – CMBS Refined Rating One-Year Transition Matrix in 2003

|             | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3   | Caa1  | Caa2  | Caa3 | Ca   | C      | WR     |       |
|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|------|------|--------|--------|-------|
| <b>Aaa</b>  | 660   | 90.9% | 0.2%  | 0.2%  | 0.2%  | 0.2%  |       |       |       |       |       |       |       |       |       |       |      |       |       |      |      |        | 8.5%   |       |
| <b>Aa1</b>  | 63    | 28.6% | 65.1% |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |      |      |        |        | 6.3%  |
| <b>Aa2</b>  | 327   | 6.4%  | 2.8%  | 83.2% | 1.2%  | 0.3%  |       | 0.3%  |       |       |       |       |       |       |       |       |      |       |       |      |      |        |        | 5.8%  |
| <b>Aa3</b>  | 88    | 8.0%  |       | 5.7%  | 75.0% | 1.1%  |       | 5.7%  |       |       |       |       |       |       |       |       |      |       |       |      |      |        |        | 4.5%  |
| <b>A1</b>   | 68    | 4.4%  | 2.9%  | 5.9%  |       | 75.0% |       | 1.5%  |       |       | 1.5%  |       |       | 1.5%  |       |       |      |       |       |      |      |        |        | 7.4%  |
| <b>A2</b>   | 318   | 0.3%  | 0.3%  | 1.9%  | 2.2%  | 3.8%  | 84.0% | 2.2%  | 0.3%  |       |       | 0.6%  |       |       |       |       |      |       |       |      |      |        |        | 4.4%  |
| <b>A3</b>   | 161   | 0.6%  |       | 1.2%  |       | 1.2%  | 1.2%  | 87.0% | 1.9%  | 0.6%  | 0.6%  |       |       |       |       |       |      |       |       |      |      |        |        | 5.6%  |
| <b>Baa1</b> | 134   |       |       |       |       | 1.5%  | 1.5%  | 1.5%  | 76.1% | 0.7%  | 0.7%  | 3.0%  | 0.7%  |       | 1.5%  |       |      |       |       |      |      |        |        | 12.7% |
| <b>Baa2</b> | 365   |       |       |       | 0.5%  |       | 0.5%  | 1.1%  | 3.6%  | 80.5% | 1.9%  | 1.4%  | 0.5%  | 0.5%  |       | 0.3%  |      |       |       |      |      |        |        | 9.0%  |
| <b>Baa3</b> | 304   |       |       | 0.3%  |       | 0.3%  |       |       | 1.0%  | 2.0%  | 79.6% | 1.3%  | 1.6%  | 1.0%  | 0.3%  |       |      |       |       |      |      |        |        | 12.5% |
| <b>Ba1</b>  | 118   |       |       |       |       |       |       | 0.8%  |       | 1.7%  | 0.8%  | 88.1% | 0.8%  | 0.8%  | 1.7%  |       |      |       |       |      |      |        |        | 5.1%  |
| <b>Ba2</b>  | 176   |       |       |       |       |       |       | 0.6%  | 0.6%  |       |       | 1.1%  | 90.9% | 1.7%  |       | 1.1%  | 0.6% |       |       |      |      |        |        | 3.4%  |
| <b>Ba3</b>  | 131   |       |       |       |       |       |       |       |       |       | 0.8%  |       |       | 89.3% | 1.5%  | 1.5%  | 1.5% | 1.5%  |       |      |      |        |        | 3.8%  |
| <b>B1</b>   | 89    | 1.1%  |       |       |       |       |       |       |       |       | 1.1%  |       |       |       | 91.0% | 2.2%  | 1.1% | 1.1%  |       | 1.1% |      |        |        | 1.1%  |
| <b>B2</b>   | 142   | 0.7%  |       |       |       |       |       |       |       |       |       |       |       | 0.7%  | 0.7%  | 87.3% | 4.9% | 1.4%  | 2.1%  |      |      | 0.7%   | 1.4%   |       |
| <b>B3</b>   | 112   |       |       |       |       |       |       |       |       |       |       |       |       | 0.9%  | 0.9%  | 86.6% | 4.5% | 2.7%  | 1.8%  | 1.8% | 1.8% | 0.9%   |        |       |
| <b>Caa1</b> | 7     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      | 71.4% | 14.3% |      |      |        | 14.3%  |       |
| <b>Caa2</b> | 31    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 3.2% |       | 74.2% | 6.5% | 9.7% | 6.5%   |        |       |
| <b>Caa3</b> | 2     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |      |      |        | 100.0% |       |
| <b>Ca</b>   | 1     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |      |      | 100.0% |        |       |
| <b>C</b>    | 4     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |      |      | 75.0%  | 25.0%  |       |



**Figure 74 – RMBS Refined Rating One-Year Transition Matrix in 2003**

|             | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1 | Caa2  | Caa3   | Ca    | C      | WR     |      |      |
|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|--------|-------|--------|--------|------|------|
| <b>Aaa</b>  | 2767  | 92.3% |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       |        |       |        | 7.7%   |      |      |
| <b>Aa1</b>  | 122   | 1.6%  | 77.0% |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       |        |       |        | 21.3%  |      |      |
| <b>Aa2</b>  | 559   | 8.1%  | 0.4%  | 86.0% |       | 0.2%  |       |       |       |       |       |       |       |       |       |       |       | 0.2% |       |        |       |        | 5.2%   |      |      |
| <b>Aa3</b>  | 163   | 3.1%  | 6.7%  | 1.8%  | 84.7% |       |       |       |       |       |       |       |       |       |       |       |       |      |       |        |       |        | 3.7%   |      |      |
| <b>A1</b>   | 137   | 0.7%  | 0.7%  | 5.1%  | 0.7%  | 82.5% |       |       | 0.7%  |       |       |       |       |       |       |       |       |      |       |        |       |        | 9.5%   |      |      |
| <b>A2</b>   | 536   | 0.4%  | 0.7%  | 5.6%  | 0.9%  | 0.6%  | 85.8% |       |       |       |       |       |       |       |       |       |       |      |       |        |       |        | 6.0%   |      |      |
| <b>A3</b>   | 152   | 0.7%  |       |       | 7.2%  | 0.7%  | 3.3%  | 81.6% |       | 0.7%  |       |       |       |       |       |       |       |      |       |        |       |        | 5.9%   |      |      |
| <b>Baa1</b> | 75    |       |       |       |       |       | 2.7%  | 1.3%  | 86.7% |       |       |       |       |       |       |       |       |      |       |        |       | 1.3%   | 8.0%   |      |      |
| <b>Baa2</b> | 476   | 0.4%  |       | 0.2%  | 0.6%  | 0.4%  | 7.6%  | 1.7%  | 1.1%  | 81.7% |       |       |       |       |       | 0.4%  | 0.2%  |      |       |        |       |        | 5.7%   |      |      |
| <b>Baa3</b> | 221   |       |       |       |       | 0.5%  |       | 3.6%  | 1.4%  |       | 82.8% |       |       | 0.5%  |       |       |       |      |       |        |       | 0.9%   | 10.4%  |      |      |
| <b>Ba1</b>  | 34    |       |       |       |       |       |       |       |       |       |       | 82.4% | 2.9%  |       |       |       |       |      |       |        |       | 2.9%   | 11.8%  |      |      |
| <b>Ba2</b>  | 217   |       |       |       | 0.5%  |       |       | 0.9%  | 0.5%  | 10.6% | 0.9%  | 0.5%  | 80.2% | 0.5%  |       |       |       |      |       |        |       | 0.9%   | 0.5%   | 0.5% | 3.7% |
| <b>Ba3</b>  | 64    |       |       |       |       |       |       |       |       | 1.6%  | 9.4%  | 3.1%  | 1.6%  | 75.0% |       |       |       |      |       |        |       | 1.6%   | 7.8%   |      |      |
| <b>B1</b>   | 19    |       |       |       |       |       |       |       |       |       |       |       |       |       | 68.4% |       |       |      |       |        |       |        | 31.6%  |      |      |
| <b>B2</b>   | 129   |       |       |       |       |       |       |       |       |       | 2.3%  |       | 12.4% | 2.3%  |       | 79.1% |       |      |       |        |       |        | 0.8%   | 3.1% |      |
| <b>B3</b>   | 38    |       |       |       |       |       |       |       |       |       | 2.6%  |       |       | 2.6%  |       |       | 73.7% |      |       |        | 5.3%  | 2.6%   | 13.2%  |      |      |
| <b>Caa1</b> | 30    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      | 96.7% |        |       | 3.3%   |        |      |      |
| <b>Caa2</b> | 10    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       | 100.0% |       |        |        |      |      |
| <b>Caa3</b> | 12    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       |        | 91.7% |        | 8.3%   |      |      |
| <b>Ca</b>   | 29    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       |        |       | 100.0% |        |      |      |
| <b>C</b>    | 5     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       |        |       |        | 100.0% |      |      |

Figure 75 – U.S. Structured Finance Refined Rating One-Year Transition Matrix in 2003

|             | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3  | B1    | B2    | B3   | Caa1  | Caa2  | Caa3  | Ca    | C     | WR    |
|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|------|-------|-------|-------|-------|-------|-------|
| <b>Aaa</b>  | 5411  | 91.6% | 0.3%  | 0.2%  | 0.3%  | 0.1%  | 0.1%  | 0.2%  | 0.1%  | 0.1%  | 0.0%  |       | 0.0%  |      |       |       |      |       |       |       |       |       | 6.8%  |
| <b>Aa1</b>  | 245   | 7.8%  | 73.5% | 0.4%  | 0.8%  | 1.6%  | 0.4%  |       | 0.4%  |       | 0.8%  |       |       |      |       | 0.4%  |      |       |       |       |       |       | 13.9% |
| <b>Aa2</b>  | 1583  | 5.4%  | 0.8%  | 86.1% | 0.8%  | 0.8%  | 0.8%  | 0.5%  | 0.1%  | 0.3%  | 0.3%  | 0.3%  | 0.1%  | 0.1% | 0.1%  |       |      | 0.1%  |       |       |       |       | 3.7%  |
| <b>Aa3</b>  | 458   | 3.1%  | 1.7%  | 1.3%  | 75.1% | 1.5%  | 1.3%  | 3.9%  | 1.5%  | 2.4%  | 0.2%  | 1.1%  | 0.4%  | 0.7% | 0.2%  | 0.4%  |      |       |       |       |       |       | 5.0%  |
| <b>A1</b>   | 478   | 2.7%  | 0.4%  | 1.3%  | 0.2%  | 75.9% | 0.6%  | 0.4%  | 0.8%  | 6.1%  | 0.8%  | 0.2%  | 0.2%  | 0.2% |       | 0.2%  | 0.2% | 0.2%  |       |       |       |       | 9.4%  |
| <b>A2</b>   | 1845  | 0.3%  | 0.4%  | 2.6%  | 0.7%  | 0.7%  | 85.5% | 0.3%  | 0.5%  | 0.8%  | 0.5%  | 0.3%  | 0.7%  | 0.5% | 0.4%  | 0.1%  | 0.4% | 0.1%  | 0.1%  | 0.1%  |       |       | 5.1%  |
| <b>A3</b>   | 600   | 0.3%  |       | 0.2%  | 2.0%  | 0.5%  | 1.0%  | 80.7% | 1.3%  | 2.0%  | 1.7%  | 0.8%  | 0.7%  | 0.5% | 0.7%  | 0.8%  | 0.8% |       | 0.3%  |       | 0.2%  |       | 5.5%  |
| <b>Baa1</b> | 321   |       |       |       |       | 0.9%  | 0.9%  | 0.6%  | 76.3% | 0.3%  | 1.2%  | 3.4%  | 0.3%  | 0.6% | 2.5%  | 0.3%  | 0.9% | 0.9%  |       |       | 0.3%  | 0.3%  | 10.0% |
| <b>Baa2</b> | 1658  | 0.5%  |       | 0.1%  | 0.2%  | 0.2%  | 2.8%  | 0.4%  | 0.9%  | 81.3% | 1.1%  | 0.8%  | 1.2%  | 0.8% | 0.8%  | 1.1%  | 0.7% | 0.3%  | 0.2%  | 0.4%  | 0.7%  | 0.5%  | 4.8%  |
| <b>Baa3</b> | 869   | 0.1%  |       | 0.1%  |       | 0.2%  |       | 1.0%  | 0.7%  | 0.8%  | 78.8% | 1.0%  | 1.2%  | 1.8% | 1.0%  | 0.5%  | 0.7% | 0.6%  | 0.1%  | 0.6%  | 1.5%  | 0.5%  | 8.7%  |
| <b>Ba1</b>  | 218   |       |       |       |       |       |       |       | 0.5%  | 1.4%  | 0.5%  | 78.9% | 0.9%  | 0.5% | 2.3%  | 1.8%  | 0.5% | 0.9%  | 1.4%  | 0.9%  | 1.8%  | 1.4%  | 6.4%  |
| <b>Ba2</b>  | 652   | 0.2%  |       |       | 0.2%  |       |       | 0.3%  | 0.3%  | 3.7%  | 0.5%  | 0.6%  | 79.9% | 0.8% | 0.9%  | 1.2%  | 0.8% | 1.5%  | 0.8%  | 0.9%  | 1.1%  | 2.8%  | 3.7%  |
| <b>Ba3</b>  | 347   |       |       |       |       |       |       |       | 0.3%  | 2.0%  | 0.6%  | 0.3%  | 74.9% | 1.4% | 0.9%  | 2.3%  | 2.3% | 2.3%  | 0.3%  | 4.3%  | 3.5%  |       | 4.6%  |
| <b>B1</b>   | 155   | 0.6%  |       |       |       |       |       |       |       |       |       |       |       |      | 70.3% | 3.2%  | 3.2% | 1.3%  | 0.6%  | 2.6%  | 3.2%  | 9.7%  | 4.5%  |
| <b>B2</b>   | 350   | 0.3%  |       |       |       |       |       |       |       |       |       |       | 4.6%  | 1.7% | 0.3%  | 79.1% | 2.3% | 1.7%  | 2.0%  | 0.3%  | 0.9%  | 3.7%  | 2.3%  |
| <b>B3</b>   | 184   |       |       |       |       |       |       |       |       |       | 0.5%  |       |       |      | 0.5%  |       | 0.5% | 76.1% | 4.3%  | 3.8%  | 3.3%  | 4.3%  | 3.3%  |
| <b>Caa1</b> | 66    |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |      | 66.7% | 1.5%  | 6.1%  | 10.6% | 13.6% | 1.5%  |
| <b>Caa2</b> | 94    |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |      |       | 67.0% | 5.3%  | 12.8% | 13.8% | 1.1%  |
| <b>Caa3</b> | 66    |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |      |       |       | 59.1% | 12.1% | 18.2% | 10.6% |
| <b>Ca</b>   | 119   |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |      |       |       |       | 75.6% | 19.3% | 5.0%  |
| <b>C</b>    | 115   |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |      |       |       |       |       | 93.0% | 7.0%  |

## **Related Research**

### **Special Comment**

Structured Finance Rating Transitions: 1983-2002, Comparisons with Corporate Ratings and Across Sectors, January 2003, (SF19612)

Payment Defaults and Material Impairments of U.S. Structured Finance Securities: 1993-2002, December 2003 (SF29418)

Default and Recovery Rates of Corporate Bond Issuers, A Statistical Review of Moody's Ratings Performance, 1920-2003, January 2004 (80989)

### **Special Report**

Rating Changes in the US Asset-Backed Securities Market: 2003 Fourth Quarter Update, January 2004, (SF30648)

Third Quarter 2003 US CDO Review: Activity Picks Up Despite Shrinking Arbitrage Opportunity, November 2003, (SF28780)

CMBS 2003 Review and 2004 Outlook, January 2004, (SF31365)

Home Equity Asset-Backed Securities: It's Been a HEL of a Year, January 2004, (SF31117)

European Structured Finance Rating Transitions: 1998-2002, March 2003, (SF20871)

Credit Migration of CDO Notes, 1996-2002, for U.S. and European Transactions, April 2003, (SF21639)

*To access any of these reports, click on the entry above. Note that these references are current as of the date of publication of this report and that more recent reports may be available. All research may not be available to all clients.*

To order reprints of this report (100 copies minimum), please call 1.212.553.1658.  
Report Number: 81239

| <u>Author</u>  | <u>Editor</u>      | <u>Associate Analyst</u> | <u>Senior Production Associate</u> |
|----------------|--------------------|--------------------------|------------------------------------|
| <i>Jian Hu</i> | <i>Dale Wagner</i> | <i>Alexandra Neely</i>   | <i>Mark A. Lee</i>                 |

© Copyright 2004, Moody's Investors Service, Inc. and/or its licensors including Moody's Assurance Company, Inc. (together, "MOODY'S"). All rights reserved. **ALL INFORMATION CONTAINED HEREIN IS PROTECTED BY COPYRIGHT LAW AND NONE OF SUCH INFORMATION MAY BE COPIED OR OTHERWISE REPRODUCED, REPACKAGED, FURTHER TRANSMITTED, TRANSFERRED, DISSEMINATED, REDISTRIBUTED OR RESOLD, OR STORED FOR SUBSEQUENT USE FOR ANY SUCH PURPOSE, IN WHOLE OR IN PART, IN ANY FORM OR MANNER OR BY ANY MEANS WHATSOEVER, BY ANY PERSON WITHOUT MOODY'S PRIOR WRITTEN CONSENT.** All information contained herein is obtained by MOODY'S from sources believed by it to be accurate and reliable. Because of the possibility of human or mechanical error as well as other factors, however, such information is provided "as is" without warranty of any kind and MOODY'S, in particular, makes no representation or warranty, express or implied, as to the accuracy, timeliness, completeness, merchantability or fitness for any particular purpose of any such information. Under no circumstances shall MOODY'S have any liability to any person or entity for (a) any loss or damage in whole or in part caused by, resulting from, or relating to, any error (negligent or otherwise) or other circumstance or contingency within or outside the control of MOODY'S or any of its directors, officers, employees or agents in connection with the procurement, collection, compilation, analysis, interpretation, communication, publication or delivery of any such information, or (b) any direct, indirect, special, consequential, compensatory or incidental damages whatsoever (including without limitation, lost profits), even if MOODY'S is advised in advance of the possibility of such damages, resulting from the use of or inability to use, any such information. The credit ratings and financial reporting analysis observations, if any, constituting part of the information contained herein are, and must be construed solely as, statements of opinion and not statements of fact or recommendations to purchase, sell or hold any securities. **NO WARRANTY, EXPRESS OR IMPLIED, AS TO THE ACCURACY, TIMELINESS, COMPLETENESS, MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OF ANY SUCH RATING OR OTHER OPINION OR INFORMATION IS GIVEN OR MADE BY MOODY'S IN ANY FORM OR MANNER WHATSOEVER.** Each rating or other opinion must be weighed solely as one factor in any investment decision made by or on behalf of any user of the information contained herein, and each such user must accordingly make its own study and evaluation of each security and of each issuer and guarantor of, and each provider of credit support for, each security that it may consider purchasing, holding or selling. MOODY'S hereby discloses that most issuers of debt securities (including corporate and municipal bonds, debentures, notes and commercial paper) and preferred stock rated by MOODY'S have, prior to assignment of any rating, agreed to pay to MOODY'S for appraisal and rating services rendered by it fees ranging from \$1,500 to \$1,800,000.

**Contact****Phone****New York**

Jian Hu  
 Alexandra Neely  
 Richard Cantor  
 Gus Harris  
 Joseph Snailer  
 Sandra Ruffin  
 Lindsay Douglas  
 Masayuki Nishida

1.212.553.1653

## Structured Finance Rating Transitions: 1983-2004

### Summary Opinion

This is Moody's third annual global structured finance ratings transition study.<sup>1</sup> We review the 2004 and historical transition rates both on an aggregate basis and within key asset classes and provide comparisons to the corporate rating transition experience. Key findings include:

- Global structured finance ratings volatility receded in 2004. 91.2% of all structured finance ratings went unchanged in 2004, up slightly from 89.8% in 2003. As a comparison, the long-term historical average rating stability rate from 1983-2004 was 92.3% in structured finance and 77.6% in corporate finance during the same period.<sup>2</sup>
- The pace of downgrades in 2004 was about the same as the pace of upgrades. The downgrade rate declined to 4.5% in 2004, from 7.1% in the previous year, and the upgrade rate rose to 4.3% from 3.1%. The overall downgrade-to-upgrade ratio dropped from 2:1 in 2003 to 1:1 in 2004.
- The average number of total notches changed per year for each downgraded security remained at 4.2, as it was in the previous year, while for each upgraded security the average number edged up to 2.7 from 2.6. By comparison, the magnitude of rating changes in the corporate sector was lower, with an average decline of 1.4 notches for each downgraded security and an increase of 1.5 notches for each upgraded security in 2004.
- The frequency of transition into Caa or below by rating category in 2004 was higher than the historical average for most rating categories, primarily due to the high Caa transition rates of securities backed by manufactured housing loans. The 2004 transition rates into Caa or below were also higher for structured finance securities than were those in corporate finance.
- U.S. ABS rating drift continued to be weighted towards downgrades although some improvements were evident this year relative to 2003. The frequency of downgrades fell to 7.8% in 2004 from 10.2% in 2003, although this remained higher than its 5.4% historical average. ABS downgrades were concentrated among securities backed by manufactured housing loans, franchise loans, aircraft and equipment leases, and tobacco settlements. ABS securities backed by autos, credit cards, and student loans continue to show strong performance in 2004.
- Ratings on securities backed by home equity loans (HEL), which are also part of the US ABS sector, were generally stable in 2004, as 96.8% of such ratings remained unchanged. The HEL sector's downgrade rate fell to 1.8% in 2004 from 2.9% in 2003, while the upgrade rate fell to 1.4% from 2.0% in 2003.
- The rating transitions experienced by US CDOs improved markedly in 2004 as a result of the sharp improvement in the corporate credit environment. The downgrade rate decreased to 5.7% in 2004, from 16.5% in 2003 and 24.3% in 2002. Furthermore, the rating transition experience of the beleaguered high-yield collateralized bond obligations (HY CBOs) segment improved sharply, as the downgrade rate fell to 7.3%, down from 33.9% in 2003, and the upgrade rate moved to 2.2%, up from 0.6%. Downgrades in US CDOs excluding HY CBOs were concentrated in resecuritization CDO deals due to the recent distress in the US ABS sector. Outside of HY CBOs and resecuritization deals, the CDO sector was particularly stable in 2004.

1. The two prior studies are, "Structured Finance Rating Transitions: 1983-2002, Comparisons with Corporate Ratings and Across Sectors," Moody's Special Comment, January 2003, and "Structured Finance Rating Transitions: 1983-2003, Ratings Remain Volatile in 2003 but Downgrade-to-Upgrade Ratio Falls Sharply," Moody's Special Comment, February 2004.

2. A glossary appears in the appendix.



- As in 2003, the US CMBS sector sustained more upgrades than downgrades in 2004. Upgrades came about largely due to amortization and pay downs that built up credit support, in addition to strong collateral performance, while downgrades were mostly driven by poorer-than-expected collateral performance. The downgrade rate increased slightly to 5.4% from 4.1% in 2003, while the upgrade rate increased to 8.3% from 5.1%. Both transition rates were higher than their historical averages.
- The RMBS sector continued to show outstanding performance, thanks to better-than-expected collateral performance and high prepayment rates, which resulted in significant increases in tranche credit enhancement levels. The upgrade rate ascended to 7.9%, its highest level since 1996, from 5.2% in 2003, while the downgrade rate was less than 0.1% in 2004.
- By region, the downgrade rate in US structured finance fell to 4.9% from 7.0% in 2003, while the upgrade rate rose to 4.6% from 3.1%. In Europe, the downgrade rate dropped sharply to 3.9% from 10.0%, thanks to the substantial improvement in European CDO transactions, while the upgrade rate fell to 1.7% in 2004, from 2.5% in 2003. About 76% of 2004 European downgrades occurred in the CDO sector. The Asia Pacific region downgraded only three ratings in 2004, or 0.3% of outstanding ratings. The upgrade rate more than doubled, to 6.8% from 3.0%, as a result of strong collateral performance and the upgrades of several third party ratings.
- The ratings stability in the global credit derivatives sector (mostly repackaged securities and structured notes) remained about the same in 2004, at 91.5%. Downgrades still outweighed upgrades by a ratio of 1.6:1. That ratio, however, was a significant improvement over the 6.9:1 downgrade-to-upgrade ratio for 2003.

**Figure 1 - Global Structured Finance Annual Downgrade and Upgrade Rates by Sector in 2004, Compared with Their Historical Annual Averages during 1991-2004<sup>3</sup>**

|                                   | Downgrade Rate |           | Upgrade Rate |           |
|-----------------------------------|----------------|-----------|--------------|-----------|
|                                   | 2004           | 1991-2004 | 2004         | 1991-2004 |
| US ABS                            | 7.8%           | 5.4%      | 2.1%         | 1.8%      |
| US HEL                            | 1.8%           | 2.0%      | 1.4%         | 1.4%      |
| US MH                             | 41.3%          | 18.0%     | 0.3%         | 2.9%      |
| US ABS excl. MH, HEL              | 8.5%           | 4.5%      | 3.6%         | 1.7%      |
| US CDOs                           | 5.7%           | 12.2%     | 0.6%         | 0.6%      |
| US HY CBOs                        | 7.3%           | 22.6%     | 2.2%         | 0.6%      |
| US CDOs excl. HY CBOs             | 5.3%           | 7.3%      | 0.2%         | 0.6%      |
| US CMBS                           | 5.4%           | 3.5%      | 8.3%         | 5.8%      |
| US RMBS                           | 0.1%           | 1.9%      | 7.9%         | 4.9%      |
| US Structured Finance             | 4.9%           | 4.3%      | 4.6%         | 3.5%      |
| European Structured Finance       | 3.9%           | 5.8%      | 1.7%         | 2.1%      |
| Asia Pacific Structured Finance   | 0.3%           | 1.9%      | 6.8%         | 3.8%      |
| Global All Structured             | 4.5%           | 4.3%      | 4.3%         | 3.4%      |
| Global All Corporate <sup>4</sup> | 8.3%           | 13.7%     | 13.4%        | 8.8%      |

<sup>3</sup> All downgrade and upgrade rates are adjusted for withdrawn ratings by removing half of the withdrawn ratings from the ratings population outstanding at the beginning of each year. The appendix contains transition rates by rating that are unadjusted for withdrawn ratings.

<sup>4</sup> Sovereign ratings are included. So are all international corporate ratings. Municipal ratings, however, are excluded.

---



---

# TABLE OF CONTENTS

---

|   |    |
|---|----|
| Overview .....  | 4  |
| Rating Transitions in the All Structured Finance Category.....  | 4  |
| Downgrade Rates Fell While Upgrade Rates Rose in 2004 .....   | 4  |
| Upgrade Rates Rose in All Rating Categories, but Transitions Rates into Caa or Below Were Also Higher ..... | 6  |
| Sector Specific Analysis of Rating Transitions .....  | 8  |
| US ABS .....  | 8  |
| US ABS Backed by Manufactured Housing Loans (MH).....   | 10 |
| US ABS Backed by Home Equity Loans (HEL) .....  | 11 |
| US ABS excluding MH and HEL .....   | 12 |
| US CDOs.....  | 13 |
| US HY CBOs.....   | 15 |
| US CDOs excluding HY CBOs.....  | 16 |
| US CMBS.....  | 17 |
| US RMBS.....  | 18 |
| Regional Comparisons of Rating Transitions.....   | 19 |
| European and U.S. Rating Transition Rates.....  | 19 |
| Asia Pacific and U.S. Rating Transition Rates.....  | 20 |
| Rating Transitions in the Credit Derivatives Sector .....   | 22 |
| Appendix I: Data Sample Criteria and Glossary.....  | 24 |
| Data Sample Criteria.....   | 24 |
| Glossary .....  | 24 |
| Treatment of Withdrawn Ratings (WR).....  | 26 |
| Appendix II: Transition Matrices .....  | 27 |
| Figure 61 – Global Structured Finance Rating Transition Matrices (Weighted Averages, 1983-2004) ....        | 27 |
| Figure 62 – US ABS Rating Transition Matrices (Weighted Averages, 1983-2004) .....                          | 28 |
| Figure 63 – US HEL Rating Transition Matrices (Weighted Averages, 1990-2004) .....                          | 29 |
| Figure 64 – US ABS (excl. MH and HEL) Rating Transition Matrices (Weighted Averages, 1983-2004) ...         | 30 |
| Figure 65 – US CDO Rating Transition Matrices (Weighted Averages, 1991-2004).....                           | 31 |
| Figure 66 – US CDO (excl. HY CBOs) Rating Transition Matrices (Weighted Averages, 1991-2004) .....          | 32 |
| Figure 67 – US CMBS Rating Transition Matrices (Weighted Averages, 1988-2004) .....                         | 33 |
| Figure 68 – US RMBS Rating Transition Matrices (Weighted Averages, 1983-2004) .....                         | 34 |
| Figure 69 – One-Year Rating Transition Matrices by Sector (Weighted Average, 1998-2004) .....               | 35 |
| Figure 70 – Two-Year Rating Transition Matrices by Sector (Weighted Average, 1998-2004).....                | 36 |
| Figure 71 – Three-Year Rating Transition Matrices by Sector (Weighted Average, 1998-2004) .....             | 37 |
| Figure 72 – One-Year Rating Transition Matrices by Sector in 2004 (adjusted for withdrawn ratings) ...      | 38 |
| Figure 73 – Global Structured Finance One-Year Refined-Rating Transition Matrix in 2004.....                | 39 |
| Figure 74 – US ABS One-Year Refined-Rating Transition Matrix in 2004 .....                                  | 40 |
| Figure 75 – US HEL One-Year Refined-Rating Transition Matrix in 2004 .....                                  | 41 |
| Figure 76 – US ABS (excl. MH, HEL) One-Year Refined-Rating Transition Matrix in 2004.....                   | 42 |
| Figure 77 – US CDOs One-Year Refined-Rating Transition Matrix in 2004.....                                  | 43 |
| Figure 78 – US CDOs (excl. HY CBOs) One-Year Refined-Rating Transition Matrix in 2004 .....                 | 44 |
| Figure 79 – US CMBS One-Year Refined-Rating Transition Matrix in 2004.....                                  | 45 |
| Figure 80 – US RMBS One-Year Refined-Rating Transition Matrix in 2004.....                                  | 46 |
| Related Research .....  | 47 |

## Overview

Worldwide, structured finance securities experienced roughly one rating upgrade per rating downgrade in 2004, showing substantial improvement over 2003, which saw a 2:1 downgrade-to-upgrade ratio.

At the beginning of 2004, there were 23,265 ratings outstanding in the global structured finance sector. Of these, 1,008 ratings from 421 deals were downgraded, while 973 ratings from 386 deals were upgraded.<sup>5</sup> 89% of the 2004 downgrades took place in the US, while 11% happened in Europe. Similarly, 87% of all 2004 upgrades were in the US, while upgrades in Europe and the Asia Pacific regions contributed 5% and 7%, respectively.

Upgrades were concentrated in the RMBS and CMBS sectors, making up roughly 74% of all upgrades (see Figure 2). The number of upgrades in ABS securities backed by home equity loans (HEL) and automobile loans were also substantial, contributing about 13% of all 2004 upgrades in the structured finance universe.

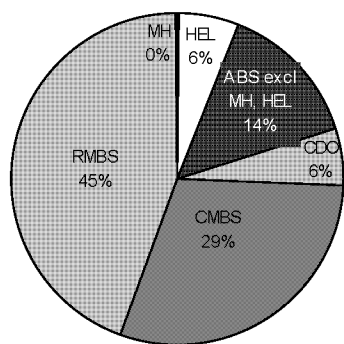
Downgrades continued to hit the manufactured housing loan category of the ABS sector. Downgrades of securities backed by manufactured housing loans accounted for about 27% of all structured finance downgrades in 2004 (see Figure 3).

ABS securities backed by aircraft or equipment leases, franchise loans, small business loans, and tobacco settlement also accounted for a significant portion, roughly 25%, of all structured finance downgrades in 2004.

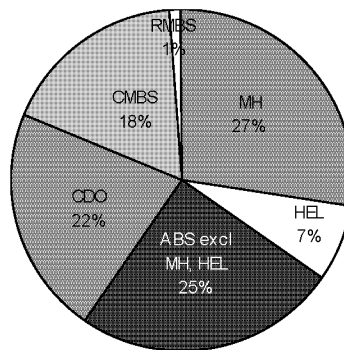
The number of downgrades in the CMBS and CDO sector was also notable, contributing about 18% and 22% of total 2004 downgrades, respectively.

The majority of the upgrades in 2004 were the result of strong collateral performance, amortization, and the increased pay-down of senior notes. Most 2004 downgrades were caused by weaker-than-expected pool performance and higher-than-expected losses on defaulted securities in collateral pools. A small proportion of rating changes were triggered by a change in a third-party rating.

**Figure 2**  
Distribution of 2004 Structured Finance Upgrades by Sector



**Figure 3**  
Distribution of 2004 Structured Finance Downgrades by Sector



## Rating Transitions In The All Structured Finance Category

In this section we analyze rating transitions in the “all structured finance” category, combining the ABS, CDO, CMBS, and RMBS sectors and all regions. Detailed rating transitions data from each of the four sectors in the US, European and Asia Pacific regions, and in the global credit derivatives sector, are presented separately later in this report.

### DOWNGRADE RATES FELL WHILE UPGRADE RATES ROSE IN 2004

World-wide, the structured finance downgrade rate declined significantly, to 4.5% from 7.1% in the prior year (Figure 4). The upgrade rate trended up in 2004, reaching 4.3%, compared to 3.1% in 2003. The magnitude of rating changes, measured by the number of notches changed per year, per downgrade or per upgrade, remained roughly the same in 2004 as it was in 2003 (Figure 5).

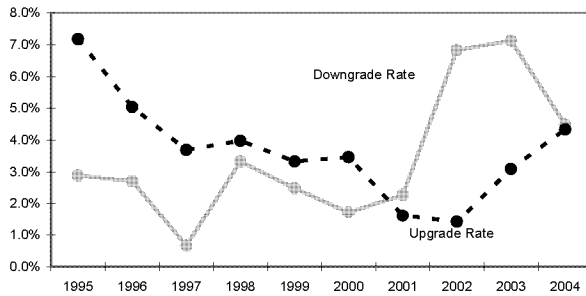
Weighted by the magnitude of downgrades, the downgrade rate declined to 19.0% in 2004, from 29.9% in 2003 (Figure 7). The upgrade rate, when weighted by the magnitude of upgrades, rose to 11.6% from 7.9%. As a result, the number of notches drifted down 7.4% as a share of all outstanding ratings at the beginning of 2004, which was much smaller (in terms of absolute values) than the 22.0% negative rating drift observed in 2003.

<sup>5</sup> In counting downgrades and upgrades, we only consider ratings at the beginning and the end of each year

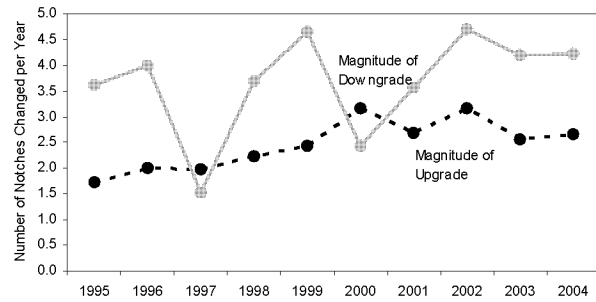


The downgrade-to-upgrade ratio was roughly 1:1 in 2004, compared to 2:1 in 2003. When weighted by the number of notches changed, the downgrade-to-upgrade ratio was 1.6:1, down from 3.8:1 in 2003 (Figure 6).

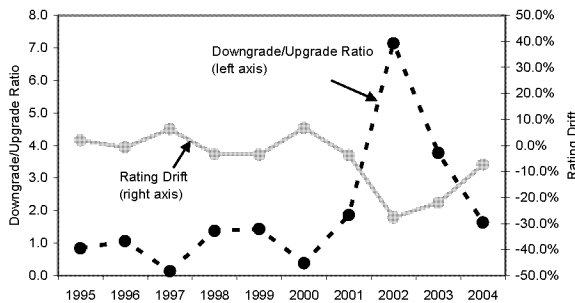
**Figure 4**  
**Structured Finance Downgrade Rates and Upgrade Rates**



**Figure 5**  
**Magnitude of Structured Finance Downgrades and Upgrades**



**Figure 6**  
**Structured Finance Rating Drift and Weighted Downgrade-to-Upgrade Ratios (Weighted by Number of Notches Changed)**



**Figure 7**  
**Structured Finance Annual Transition Rates**

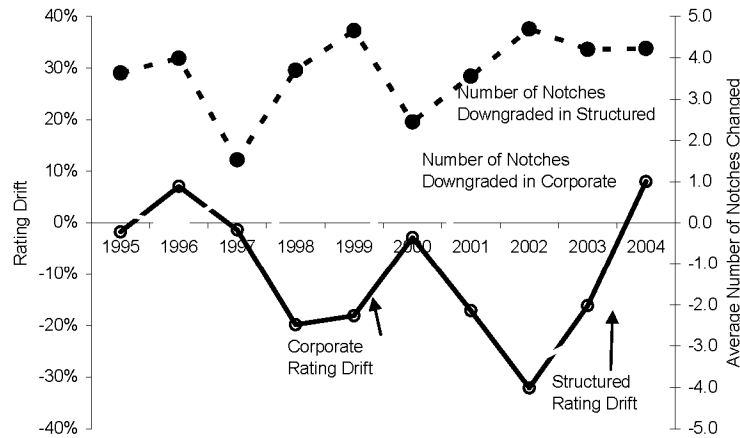
|                                    | 1991-2004 | 2004  | 2003   |
|------------------------------------|-----------|-------|--------|
| Downgrade Rate                     | 4.3%      | 4.5%  | 7.1%   |
| Upgrade Rate                       | 3.4%      | 4.3%  | 3.1%   |
| Downgrade Rate (notch weighted)    | 17.2%     | 19.0% | 29.9%  |
| Upgrade Rate (notch weighted)      | 8.5%      | 11.6% | 7.9%   |
| Rating Drift (notch weighted)      | -8.7%     | -7.4% | -22.0% |
| Rating Volatility (notch weighted) | 25.7%     | 30.5% | 37.9%  |
| Stability Rate                     | 92.3%     | 91.2% | 89.8%  |
| Withdrawal Rate                    | 7.2%      | 6.9%  | 11.4%  |

The rating drift in structured finance appears to be correlated with that in corporate finance (Figure 8). Both sectors experienced their largest negative rating drift in 2002 of about 30%, and both have recovered significantly since then; corporate ratings drifted positively in 2004.<sup>6</sup>

Similar to our findings in previous reports, structured finance ratings downgrades tend to be less frequent, but more severe than corporate finance rating downgrades. Figure 8 shows that the average number of notches downgraded among all rating downgrades during 2004 was 2.8 notches higher in structured than in corporate. The lower frequency but higher severity of structured finance rating downgrades offset each other, resulting in an average rating drift that is very similar to the corporate sector.

<sup>6</sup> Upgrades in the Asia Pacific region made a significant contribution to the positive rating drift in global corporate finance during 2004. See Moody's Special Comment, "Moody's Rating Actions, Reviews, and Outlooks: Quarterly Update," January 2005.

**Figure 8**  
**Comparisons of Ratings Drift and Average Number of Notches Changed per Downgrade per Year**  
**between Structured Finance and Corporate Finance**



Also, as noted in our previous studies, the structured finance sector has historically exhibited strong positive rating momentum, so that another downgrade is much more likely for a security that has recently been downgraded than for a security whose rating has recently been stable or upgraded. In 2004, this pattern continued. In fact, 42.9% of all securities that were downgraded during the year had previously been downgraded in 2003, while only 10% of 2004 upgrades, experienced an upgrade in 2003. This indicates relatively stronger ratings change momentum in 2004 than in 2003. By comparison, 32% of 2003 downgrades had experienced a downgrade in 2002, and the percentage was 2% for upgrades.

**Upgrade Rates Rose in All Rating Categories, but Transitions Rates into Caa or Below Were Also Higher**

Upgrade rates in 2004 in almost all broad rating categories (the only exception being the Ba rating category) were higher than their historical averages (Figure 9), while downgrade rates were generally lower than historical averages. As a result, ratings stability rates by rating were slightly lower than their historical averages. Stability in the investment-grade rating categories remained higher in 2004 than in the speculative-grade categories. Furthermore, the Aaa category continues to be the most stable among all rating categories.

Figure 9 also shows that the structured finance sector’s rating transition rates into the Caa or below category were higher in 2004 than their historical averages, and were also higher than the historical averages in the global corporate sector. The downgrades in the US ABS sector were the major contributing factor (to be discussed later).

**Figure 9 - Global Structured Finance Annual Ratings Transition Matrices, Compared with Global Corporate Annual Ratings Transitions Matrices<sup>7</sup>**

| Structured Finance in 2004                              |        | Ratings to: |        |        |        |        |              |  |
|---|--------|-------------|--------|--------|--------|--------|--------------|--|
| Ratings from:   | Aaa    | Aa          | A      | Baa    | Ba     | B      | Caa or below |  |
| Aaa   | 99.15% | 0.33%       | 0.22%  | 0.09%  | 0.11%  | 0.08%  | 0.03%        |  |
| Aa  | 6.67%  | 90.52%      | 1.46%  | 0.39%  | 0.18%  | 0.30%  | 0.48%        |  |
| A   | 1.45%  | 4.56%       | 91.30% | 1.55%  | 0.52%  | 0.17%  | 0.45%        |  |
| Baa   | 0.29%  | 0.92%       | 3.70%  | 90.58% | 2.48%  | 0.73%  | 1.29%        |  |
| Ba  | 0.19%  | 0.25%       | 1.02%  | 2.92%  | 86.47% | 4.13%  | 5.02%        |  |
| B   |        |             | 0.11%  | 0.22%  | 3.65%  | 81.07% | 14.94%       |  |
| Caa or below  |        |             |        |        |        | 0.70%  | 99.30%       |  |
| <b>Structured Finance: 1983-2004 average</b>            |        |             |        |        |        |        |              |  |
| Ratings from:   | Aaa    | Aa          | A      | Baa    | Ba     | B      | Caa or below |  |
| Aaa   | 98.97% | 0.69%       | 0.20%  | 0.07%  | 0.03%  | 0.02%  | 0.03%        |  |
| Aa  | 5.70%  | 91.01%      | 2.12%  | 0.71%  | 0.19%  | 0.13%  | 0.15%        |  |
| A   | 1.12%  | 2.85%       | 92.83% | 2.05%  | 0.66%  | 0.24%  | 0.25%        |  |
| Baa   | 0.40%  | 0.60%       | 2.54%  | 90.48% | 3.34%  | 1.34%  | 1.29%        |  |
| Ba  | 0.13%  | 0.10%       | 0.71%  | 3.38%  | 86.12% | 3.72%  | 5.84%        |  |
| B   | 0.06%  |             | 0.08%  | 0.47%  | 2.00%  | 85.98% | 11.42%       |  |
| Caa or below  |        |             |        |        | 0.05%  | 0.42%  | 99.53%       |  |
| <b>Corporate Finance: 1983-2004 average<sup>8</sup></b> |        |             |        |        |        |        |              |  |
| Ratings from:   | Aaa    | Aa          | A      | Baa    | Ba     | B      | Caa or below |  |
| Aaa   | 91.68% | 7.53%       | 0.76%  |        | 0.02%  |        |              |  |
| Aa  | 0.92%  | 90.61%      | 8.03%  | 0.32%  | 0.08%  | 0.01%  | 0.03%        |  |
| A   | 0.04%  | 2.50%       | 91.09% | 5.52%  | 0.62%  | 0.19%  | 0.03%        |  |
| Baa   | 0.04%  | 0.25%       | 5.66%  | 87.62% | 5.01%  | 1.06%  | 0.36%        |  |
| Ba  | 0.01%  | 0.03%       | 0.55%  | 5.60%  | 83.30% | 8.41%  | 2.09%        |  |
| B   | 0.01%  | 0.05%       | 0.21%  | 0.55%  | 6.00%  | 82.27% | 10.90%       |  |
| Caa or below  |        |             |        | 0.88%  | 2.25%  | 6.44%  | 90.43%       |  |

<sup>7</sup> Rating transition rates are adjusted for withdrawn ratings. We deduct half of the withdrawn ratings from the total number of ratings outstanding at the beginning of each year. The frequency of ratings remaining unchanged – the rating stability rate – is one minus the sum of the transition rates into different rating categories. Rating transition rates unadjusted for withdrawn ratings are provided in the appendix.

<sup>8</sup> Corporate defaults are included in the Caa or below category. Corporate rating transition rates are similarly adjusted for withdrawn ratings. More detailed corporate rating transition rates can be found in Moody's Special Comment, "Default and Recovery Rates of Corporate Bond Issuers, 1920-2004," January 2005.

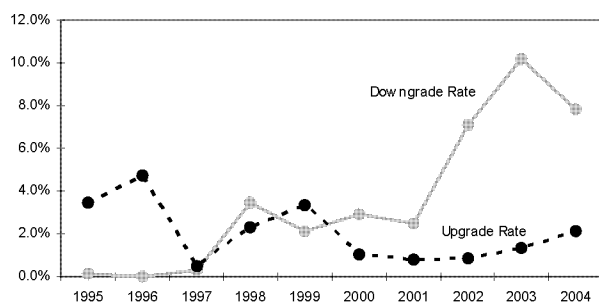
## Sector Specific Analysis Of Rating Transitions

### US ABS

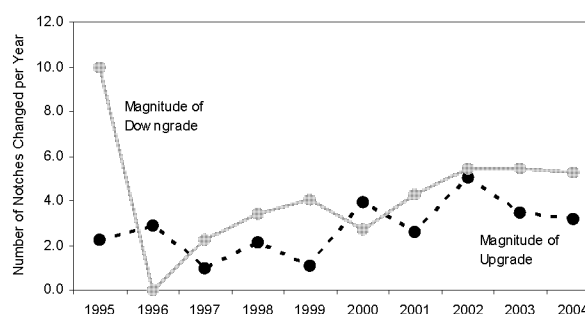
Out of a total universe of 7,725 US ABS ratings at the beginning of 2004, 586 ratings from 228 deals were downgraded and 160 ratings from 97 deals were upgraded in 2004. The downgrade rate in the US ABS sector declined to 7.8% relative to the year prior rate of 10.2% (Figure 10). The upgrade rate improved slightly, to 2.1% from 1.3% in 2003.

The magnitude of rating downgrades was 5.3 in 2004, roughly the same as in 2003, while the upgrade magnitude slid to 3.2 from 3.5 (Figure 11). The rating stability rate improved slightly to 90.1% from 88.5% (Figure 13), while the weighted downgrade-to-upgrade ratio (weighted by the number of notches downgraded and upgraded) fell sharply to 6:1 from 12:1 in 2003 (Figure 12).

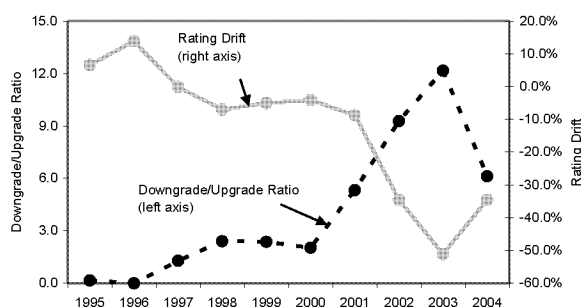
**Figure 10**  
US ABS Downgrade Rates and Upgrade Rates



**Figure 11**  
Magnitude of US ABS Downgrades and Upgrades



**Figure 12**  
US ABS Rating Drift and Downgrade-to-Upgrade Ratios (Weighted by Notches Changed)



**Figure 13**  
US ABS Annual Transition Rates

|                                    | 1991-2004 | 2004   | 2003   |
|------------------------------------|-----------|--------|--------|
| Downgrade Rate                     | 5.4%      | 7.8%   | 10.2%  |
| Upgrade Rate                       | 1.8%      | 2.1%   | 1.3%   |
| Downgrade Rate (notch weighted)    | 27.0%     | 41.2%  | 55.6%  |
| Upgrade Rate (notch weighted)      | 5.0%      | 6.7%   | 4.6%   |
| Rating Drift (notch weighted)      | -21.9%    | -34.5% | -51.1% |
| Rating Volatility (notch weighted) | 32.0%     | 48.0%  | 60.2%  |
| Stability Rate                     | 92.8%     | 90.1%  | 88.5%  |
| Withdrawal Rate                    | 7.4%      | 5.3%   | 9.0%   |

The US ABS downgrade rate, when weighted by the magnitude of downgrades (weighted downgrade rate), declined to 41.2% in 2004, from 55.6% in 2003 (Figure 13). The weighted upgrade rate rose to 6.7% in 2004 from 4.6%. As a result, the number of rated notches drifted down 34.5% as a share of all outstanding ratings at the beginning of 2004, an improvement over the negative 51.1% rating drift in 2003.

Similar to our findings in 2003 for the US ABS sector, transactions backed by manufactured housing loans, franchise loans, aircraft or equipment leases, and tobacco settlements were most affected by downgrades. ABS securities backed by traditional consumer credit, such as auto loans, credit card receivables, and home equity loans continued to perform well.

Figure 14 takes a closer look at the downgrade and the upgrade rates for a few selected asset classes within this sector.

|                                 | Ratings Outstanding on 1/1/2004 | Number of Downgrades in 2004 | Number of Upgrades in 2004 | Downgrade Rate in 2004 | Upgrade rate in 2004 |
|---------------------------------|---------------------------------|------------------------------|----------------------------|------------------------|----------------------|
| Manufactured Housing (MH)       | 671                             | 276                          | 2                          | 41.1%                  | 0.3%                 |
| HEL                             | 4122                            | 73                           | 57                         | 1.8%                   | 1.4%                 |
| Autos                           | 503                             | 6                            | 70                         | 1.2%                   | 13.9%                |
| Credit Cards                    | 957                             |                              | 10                         | 0.0%                   | 1.0%                 |
| Aircraft Leases                 | 62                              | 41                           |                            | 66.1%                  | 0.0%                 |
| Equipment Leases                | 151                             | 50                           | 6                          | 33.1%                  | 4.0%                 |
| Franchise Loans                 | 156                             | 66                           |                            | 42.3%                  | 0.0%                 |
| Small Business Loans            | 124                             | 18                           |                            | 14.5%                  | 0.0%                 |
| Tobacco Settlements             | 60                              | 55                           |                            | 91.7%                  | 0.0%                 |
| Student Loans                   | 412                             |                              | 4                          | 0.0%                   | 1.0%                 |
| Others                          | 507                             | 1                            | 11                         | 0.2%                   | 2.2%                 |
| US ABS total (excl. MH and HEL) | 2932                            | 237                          | 101                        | 8.1%                   | 3.4%                 |
| US ABS total (incl MH and HEL)  | 7725                            | 586                          | 160                        | 7.6%                   | 2.1%                 |

Due to the unprecedented distress in the manufactured housing category of the ABS sector, and the exponential growth in the HEL category, we analyze separately the rating transitions of MH and HEL securities and ABS securities excluding MH and HEL in the following sections.

<sup>9</sup> Downgrade and upgrade rates by each ABS asset class in this particular table are not adjusted for withdrawn ratings.

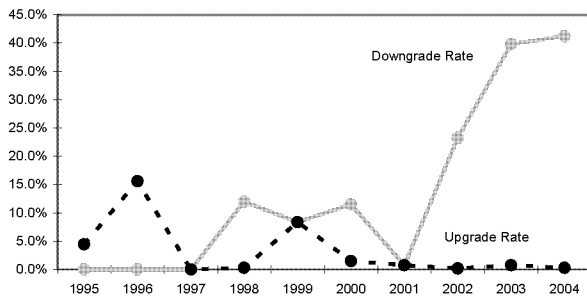
## US ABS Backed By Manufactured Housing Loans (MH)

The manufactured housing loan category of the ABS sector saw 276 ratings from 100 transactions downgraded in 2004. The number of downgrades in 2004 exceeded that in 2003. Similar to the 2003 downgrades, the main reason behind the 2004 downgrades was significantly weaker-than-expected pool performance and the resulting erosion of credit support.

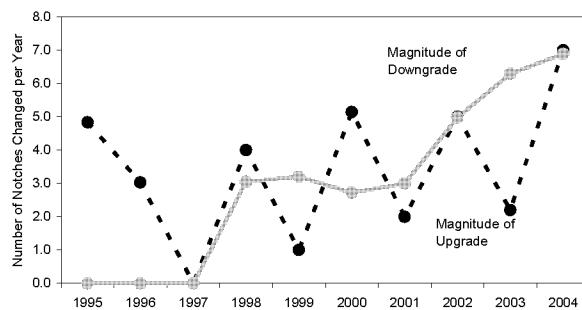
Almost all MH issuers were affected by high levels of cumulative repossessions and losses. Many subordinated tranches of MH transactions have sustained material impairments due to interest shortfalls and principal losses.<sup>10</sup>

Consequently, the MH category experienced a 41.3% downgrade rate in 2004, up slightly from the 39.8% downgrade rate in 2003 (Figure 15). The average number of notches downgraded in 2004 increased to 6.9 from 6.3 in 2003 (Figure 16). The rating drift - the total number of upgraded notches minus the total number of downgraded notches as a share of all outstanding MH ratings - was close to -300% (Figure 17). The MH category's rating stability rate remained below 60% for the second consecutive year.

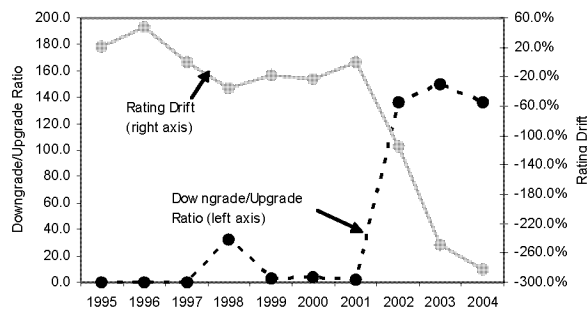
**Figure 15**  
US MH Downgrade Rates and Upgrade Rates



**Figure 16**  
Magnitude of US MH Downgrades and Upgrades



**Figure 17**  
US MH Rating Drift and Downgrade-to-Upgrade Ratios (Weighted by Notches Changed)



**Figure 18**  
US MH Annual Transition Rates

|                                    | 1991-2004 | 2004    | 2003    |
|------------------------------------|-----------|---------|---------|
| Downgrade Rate                     | 18.0%     | 41.3%   | 39.8%   |
| Upgrade Rate                       | 2.9%      | 0.3%    | 0.8%    |
| Downgrade Rate (notch weighted)    | 102.6%    | 284.5%  | 250.8%  |
| Upgrade Rate (notch weighted)      | 7.0%      | 2.1%    | 1.7%    |
| Rating Drift (notch weighted)      | -95.6%    | -282.4% | -249.1% |
| Rating Volatility (notch weighted) | 109.8%    | 286.5%  | 252.5%  |
| Stability Rate                     | 79.1%     | 58.4%   | 59.4%   |
| Withdrawal Rate                    | 2.2%      | 0.6%    | 1.4%    |

<sup>10</sup> See Moody's Structured Finance Special Reports, "2004 Review and 2005 Outlook: Manufactured Housing Asset Backed Securities," and "2004 Review and 2005 Outlook: US ABS," January 2005. Also see "Default & Loss Rates of Structured Finance Securities: 1993-2003," Moody's Special Comment, September 2004.

## US ABS Backed By Home Equity Loans (HEL)

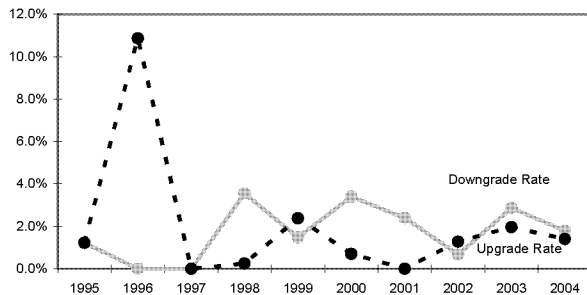
Out of a total universe of 4,122 US HEL ratings at the beginning of 2004, 73 ratings from 37 deals were downgraded and 57 ratings from 24 deals were upgraded. The downgrade rate in the HEL category of the ABS sector declined to 1.8% from 2.9% (Figure 19 and Figure 22). The upgrade rate also edged down to 1.4% in the year, compared to 2.0% in 2003.

All HEL downgrades in 2004 were related to poor collateral performance, as demonstrated by high projected losses and low credit support levels. Some downgraded transactions have continued to see the rise in the number of seriously delinquent loans in their pipelines.

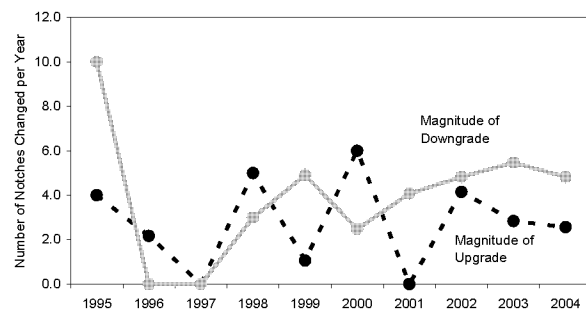
All HEL upgrades were the result of strong pool performance and/or the build-up in credit enhancement levels relative to projected future losses on the underlying mortgage pools.<sup>11</sup>

The magnitude of downgrades fell in 2004 to 4.8 from the 2003 value of 5.5, while that of upgrades, at 2.6, was only marginally lower than 2.8 in 2003 (Figure 20). The negative rating drift continued in 2004, but by a smaller magnitude of -5.1% versus -10.1% in 2003 (Figure 21), while the weighted downgrade-to-upgrade ratio edged down to 2.4:1 from 2.8:1.

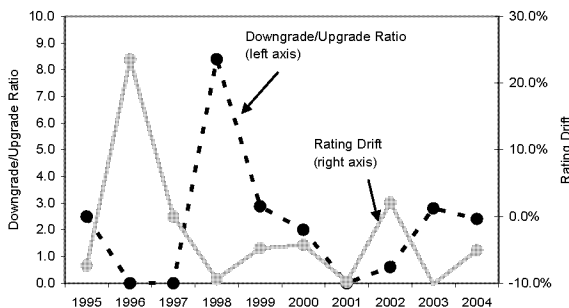
**Figure 19**  
US HEL Downgrade Rates and Upgrade Rates



**Figure 20**  
Magnitude of US HEL Downgrades and Upgrades



**Figure 21**  
US HEL Ratings Drift and Downgrade-to-Upgrade Ratios (Weighted by Notches Changed)



**Figure 22**  
US HEL Annual Transition Rates

|                                    | 1991-2004 | 2004  | 2003   |
|------------------------------------|-----------|-------|--------|
| Downgrade Rate                     | 2.0%      | 1.8%  | 2.9%   |
| Upgrade Rate                       | 1.4%      | 1.4%  | 2.0%   |
| Downgrade Rate (notch weighted)    | 9.2%      | 8.7%  | 15.7%  |
| Upgrade Rate (notch weighted)      | 4.0%      | 3.6%  | 5.6%   |
| Rating Drift (notch weighted)      | -5.3%     | -5.1% | -10.1% |
| Rating Volatility (notch weighted) | 13.2%     | 12.3% | 21.3%  |
| Stability Rate                     | 96.5%     | 96.8% | 95.2%  |
| Withdrawal Rate                    | 3.8%      | 3.1%  | 6.3%   |

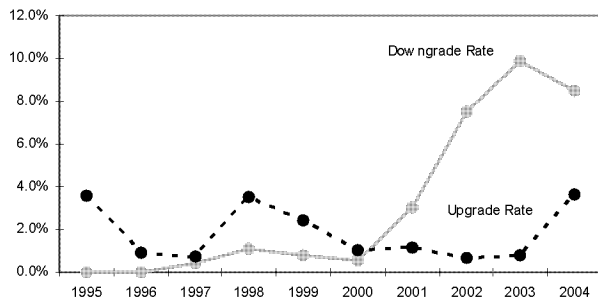
<sup>11</sup> See "2004 Review & 2005 Outlook: Home Equity ABS HEL Volume Soars to Heavenly Heights," Moody's Structured Finance Special Report, January 2005.

## US ABS excluding MH And HEL

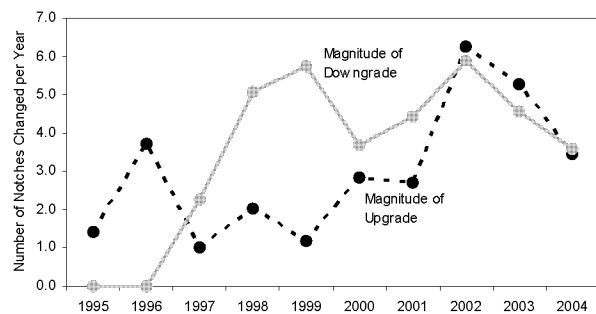
The US ABS sector, outside of MH and HEL, also experienced some distress in 2004. Out of a total universe of 2,932 ratings at the beginning of 2004, 237 ratings from 95 deals were downgraded and 101 ratings from 71 deals were upgraded in 2004. The downgrade rate in this category of the ABS sector decreased only slightly to 8.5% from 9.9% (Figures 14, 23, 26). The upgrade rate, however, shot up to 3.6%, from 0.8% in 2003. Unlike the downgrade and upgrade rates in 2003 and the historical averages, the downgrade and upgrade rates in 2004 in the ABS sector outside of MH and HEL were higher than the rates in the ABS sector as a whole (Figure 13 and Figure 26).

The magnitude of downgrades was 3.6 in 2004, down from 4.6 in 2003, while that of upgrades slid to 3.4 from 5.3 (Figure 24). The rating drift was negative in 2004, at -17.9%, which was significantly less pronounced than the -40.9% rating drift in 2003, while the weighted downgrade-to-upgrade ratio plunged to 2.4:1 from 10.5:1 in 2003 (Figure 25).

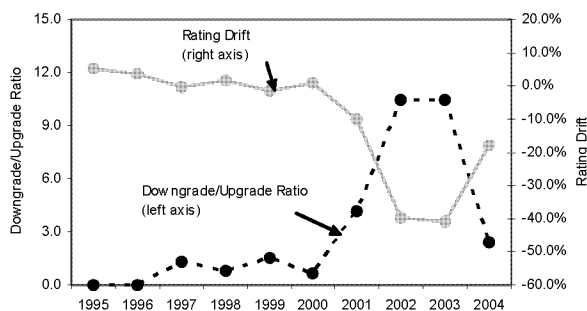
**Figure 23**  
US ABS (excl. MH and HEL) Downgrade Rates and Upgrade Rates



**Figure 24**  
Magnitude of US ABS (excl. MH and HEL) Downgrades and Upgrades



**Figure 25**  
Figure 25 - US ABS (excl. MH and HEL) Rating Drift and Downgrade-to-Upgrade Ratios (Weighted by Notches Changed)



**Figure 26**  
US ABS (excl. MH and HEL) Annual Transition Rates

|                                    | 1991-2004 | 2004   | 2003   |
|------------------------------------|-----------|--------|--------|
| Downgrade Rate                     | 4.5%      | 8.5%   | 9.9%   |
| Upgrade Rate                       | 1.7%      | 3.6%   | 0.8%   |
| Downgrade Rate (notch weighted)    | 19.8%     | 30.3%  | 45.2%  |
| Upgrade Rate (notch weighted)      | 5.2%      | 12.4%  | 4.3%   |
| Rating Drift (notch weighted)      | -14.6%    | -17.9% | -40.9% |
| Rating Volatility (notch weighted) | 24.9%     | 42.7%  | 49.5%  |
| Stability Rate                     | 93.7%     | 87.9%  | 89.3%  |
| Withdrawal Rate                    | 10.8%     | 9.4%   | 13.5%  |

The majority of downgrades in the ABS sector outside of MH and HEL were driven by weak collateral performance. The worsening performance of these collateral pools was closely related to difficulties in the aircraft, equipment leases and small business sectors.<sup>12</sup>

Over the course of 2004, Moody's downgraded 41 aircraft lease securities due to weak collateral performance. These transactions experienced lower cash flows in 2004 as a result of lease restructurings, delinquent and bankrupt lessees, increased maintenance expenses, and added uncertainty over future lease rates.

Moody's continued to downgrade securities in the franchise loan category of the ABS sector because of continuing high levels of defaulted obligors and the low recovery rates of such obligors. Eighteen securities from seven transactions backed by small business loans, but issued by a single issuer – the First International Bank (FIB) – were also downgraded as a result of the much lower-than-expected recovery rates realized on the defaulted loans.

<sup>12</sup> Also see "2004 Review and 2005 Outlook: US ABS," and "2004 Review and 2005 Outlook: Commercial ABS," Moody's Structured Finance Special Reports, January 2005.



In addition to weak collateral performance, legal challenges related to tobacco settlement issues caused a substantial number of downgrades in 2004. On April 21, 2004, Moody's downgraded its ratings on all municipal tobacco transactions. This wide-range rating action was prompted by the denial by the United States Court of Appeals for the Second Circuit in *Freedom Holdings, Inc. v. Spitzer* ("Freedom Holdings") of petitions for rehearing. The Second Circuit panel had previously reversed a lower court's dismissal of a challenge to the New York Contraband Statutes based on its views of certain immunities for federal antitrust violations.<sup>13</sup>

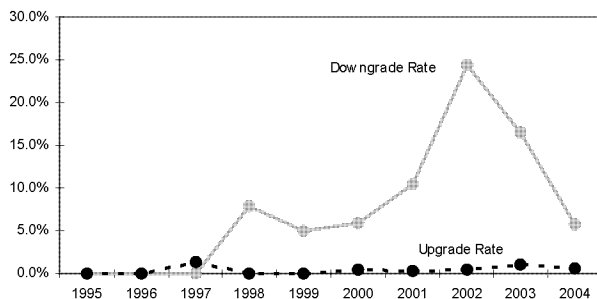
In contrast, auto and credit card ABS securities continued to perform well. No downgrades were observed for credit-card ABS securities in 2004 and 10 securities were upgraded (Figure 14). Auto ABS recorded a 14% upgrade rate in 2004 as a result of the inclusion of non-declining enhancements and initial trapping of excess spread within transactions, despite the fact that most auto loan pools performed in line with, or even slightly worse than, initial expectations.

## US CDOs

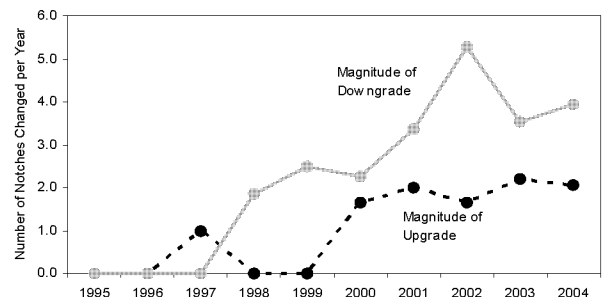
The US CDO sector continued its dramatic turn-around in 2004.<sup>14</sup> Out of a total universe of 2,400 US CDO ratings outstanding at the beginning of the year, 133 ratings from 70 deals were downgraded and 14 ratings from 11 deals were upgraded. In comparison, the number of downgrades in 2002 and 2003 was 362 and 316, respectively. As a result, the downgrade rate fell to 5.7% from 16.5% in 2003 (Figure 27). The upgrade rate ticked down to 0.6% in the course of the year, compared to 1.0% in 2003.

The magnitude of rating downgrades grew to 4.0 in 2004, compared to 3.5 in 2003, while the magnitude of upgrades was 2.1, roughly the same as in the prior year (Figure 28). The rating stability rate improved significantly to 93.7% from 82.5%, while the rating drift jumped to -21.3%, from -56.1% in 2003 (Figure 29). Meanwhile, the weighted downgrade-to-upgrade ratio plummeted from roughly 200:1 in 2002 to 18:1 in 2004.

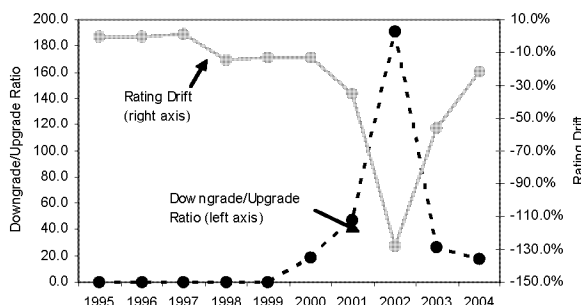
**Figure 27**  
US CDO Downgrade Rates and Upgrade Rates



**Figure 28**  
Magnitude of US CDO Downgrades and Upgrades



**Figure 29**  
US CDO Rating Drift and Downgrade-to-Upgrade Ratios (Weighted by Notches Changed)



**Figure 30**  
US CDO Annual Transition Rates

|                                    | 1991-2004 | 2004   | 2003   |
|------------------------------------|-----------|--------|--------|
| Downgrade Rate                     | 12.2%     | 5.7%   | 16.5%  |
| Upgrade Rate                       | 0.6%      | 0.6%   | 1.0%   |
| Downgrade Rate (notch weighted)    | 50.0%     | 22.5%  | 58.3%  |
| Upgrade Rate (notch weighted)      | 1.2%      | 1.2%   | 2.2%   |
| Rating Drift (notch weighted)      | -48.9%    | -21.3% | -56.1% |
| Rating Volatility (notch weighted) | 51.2%     | 23.7%  | 60.4%  |
| Stability Rate                     | 87.3%     | 93.7%  | 82.5%  |
| Withdrawal Rate                    | 4.1%      | 5.3%   | 4.2%   |

<sup>13</sup> A detailed analysis of the case was presented in a Moody's Special Report titled "Tobacco Bonds and the Implications of Freedom Holdings" dated January 27, 2004, as well as in a press release dated February 20, 2004 in which Moody's placed all the tobacco settlement related bonds on watch for possible downgrade.

<sup>14</sup> See "Rating Actions in the U.S. CDO Market: Year-to-Date Review - June 2004," Moody's Structured Finance Special Report, August 2004. More detailed analysis of CDO ratings migration statistics in 2004 will be published in a separate study. See also "Credit Migration of CDO Notes, 1996-2003, for US and European Transactions," Moody's Structured Finance Special Report, March 2004.

As weighted by the magnitude of downgrades, the US CDO downgrade rate declined to 22.5% in 2004, from 58.3% in 2003 (Figure 30). The upgrade rate, when weighted by the magnitude of upgrades, was 1.2% in 2004, slightly lower than the 2.2% level in the prior year. As a result, the number of notches drifted down 21.3% as a share of all outstanding ratings at the beginning of 2004. This negative rating drift was substantially less than the negative drift seen in 2003 and the historical average.

Within the US CDO sector, downgrades were concentrated in resecuritization CDOs (CDOs of structured finance securities) and high-yield collateralized bond obligations (HY CBOs) (see Figure 31). The troubles in ABS transactions backed by manufactured housing loans, franchise loans, aircraft or equipment leases had a direct impact on the resecuritization CDO ratings.

The HY CBO category of the CDO sector continued to experience downgrades, although the scale of the downgrades was much more subdued than in 2003. Due to deal delivering, some HY CBO tranches were, in fact, upgraded.

Unlike 2003, the synthetic arbitrage, investment-grade CBO, and balance-sheet synthetic categories of the US CDO sector experienced few rating changes in 2004. Additionally, the high-yield CLO category continued to sustain low transition rates in 2004.

**Figure 31 - Downgrade Rates and Upgrade Rates in 2004 by Deal Type in US CDOs<sup>15</sup>**

|                                | Ratings Outstanding on 1/1/2004 | Number of Downgrades Rate in 2004 | Number of Upgrades in 2004 | Downgrade Rate in 2004 | Upgrade rate in 2004 |
|--------------------------------|---------------------------------|-----------------------------------|----------------------------|------------------------|----------------------|
| HY CBOs                        | 520                             | 37                                | 11                         | 7.1%                   | 2.1%                 |
| Balance Sheet Cash Flow        | 51                              | 0                                 | 0                          | 0.0%                   | 0.0%                 |
| Balance Sheet Synthetic        | 57                              | 6                                 | 0                          | 10.5%                  | 0.0%                 |
| HY CLOs                        | 700                             | 2                                 | 2                          | 0.3%                   | 0.3%                 |
| Resecuritization <sup>16</sup> | 498                             | 77                                | 0                          | 15.5%                  | 0.0%                 |
| Synthetic Arbitrage            | 225                             | 2                                 | 0                          | 0.9%                   | 0.0%                 |
| Emerging Market                | 52                              | 2                                 | 0                          | 3.9%                   | 0.0%                 |
| Market Value                   | 77                              | 2                                 | 0                          | 2.6%                   | 0.0%                 |
| Investment-Grade CBO           | 116                             | 5                                 | 0                          | 4.3%                   | 0.0%                 |
| Preferred Stocks               | 73                              | 0                                 | 0                          | 0.0%                   | 0.0%                 |
| Others                         | 31                              | 0                                 | 1                          | 0.0%                   | 3.2%                 |
| US CDOs (excl. HY CBO)         | 1880                            | 96                                | 3                          | 5.1%                   | 0.2%                 |
| US CDOs (incl. HY CBO)         | 2400                            | 133                               | 14                         | 5.5%                   | 0.6%                 |

Because of the unprecedented distress in the HY CBO category and its impact on the overall CDO sector's performance, in the next two sections, we analyze the HY CBO category, and the CDO sector without HY CBOs, separately.

<sup>15</sup> Downgrade and upgrade rates by each CDO deal type in this particular table are not adjusted for withdrawn ratings.

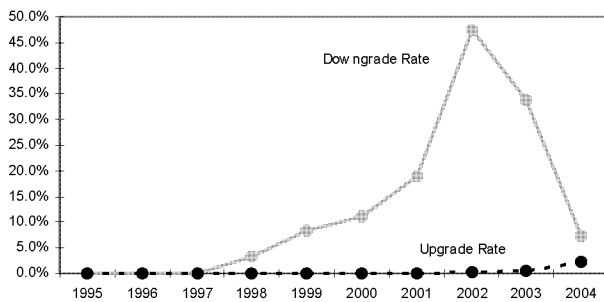
<sup>16</sup> CDOs of structured finance securities

## US HY CBOs

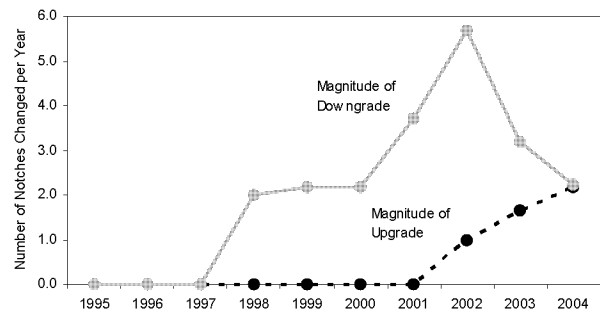
The US HY CBO category had 520 ratings at the beginning of 2004. 37 ratings were downgraded in 2004, compared to 247 and 176 downgrades in 2002 and 2003, respectively. The downgrade rate dropped significantly from 33.9% in 2003 to 7.3% in 2004 (Figure 32). The upgrade rate also rose to 2.2%, compared to 0.6% in 2003, thanks to the significant delevering of many early-vintage HY CBO deals.

The magnitude of rating downgrades decreased to 2.2 in 2004, from 3.2 in 2003, while the upgrade magnitude increased to 2.2, from 1.7 in the prior year (Figure 33). The rating drift leaped to -11.6% from -107.5% in 2003, while the rating stability rate jumped to 90.6% from 65.5% (Figure 35). The weighted downgrade-to-upgrade ratio plummeted from roughly 1,400:1 in 2002<sup>17</sup> to 113:1 in 2003 and 3.5:1 in 2004 (Figure 34).

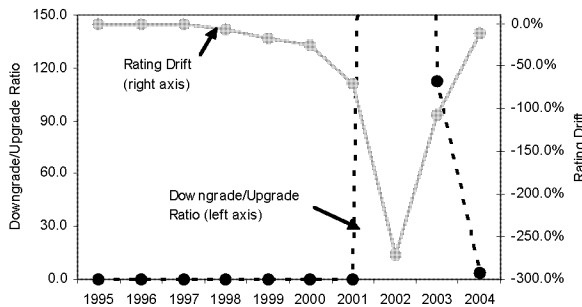
**Figure 32**  
US HY CBO Downgrade Rates and Upgrade Rates



**Figure 33**  
Magnitude of US HY CBO Downgrades and Upgrades



**Figure 34**  
US HY CBO Rating Drift and Downgrade-to-Upgrade Ratios (Weighted by Notches Changed)



**Figure 35**  
US HY CBO Annual Transition Rates

|                                    | 1991-2004 | 2004   | 2003    |
|------------------------------------|-----------|--------|---------|
| Downgrade Rate                     | 22.6%     | 7.3%   | 33.9%   |
| Upgrade Rate                       | 0.6%      | 2.2%   | 0.6%    |
| Downgrade Rate (notch weighted)    | 94.4%     | 16.3%  | 108.5%  |
| Upgrade Rate (notch weighted)      | 1.2%      | 4.7%   | 1.0%    |
| Rating Drift (notch weighted)      | -93.2%    | -11.6% | -107.5% |
| Rating Volatility (notch weighted) | 95.5%     | 21.0%  | 109.4%  |
| Stability Rate                     | 76.8%     | 90.6%  | 65.5%   |
| Withdrawal Rate                    | 2.4%      | 4.0%   | 3.0%    |

<sup>17</sup> Only one rating was upgraded in 2002 while 247 ratings were downgraded. The weighted downgrade-to-upgrade ratio is too large relative to the ratios in other years, therefore is not shown in Figure 34.

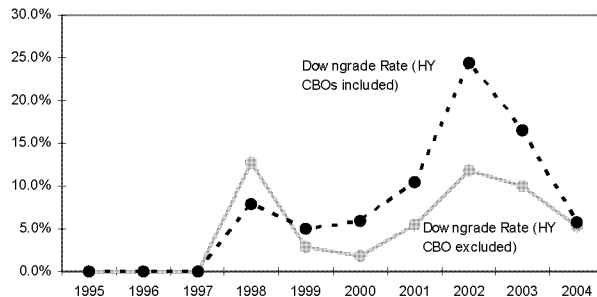
## US CDOs Excluding HY CBOs

The US HY CBO category has had a significant impact on the CDO sector's overall performance over the past five years. The downgrade rate of US CDOs, excluding HY CBOs, averaged 7.3% during 1991-2004 (Figure 39), compared to 12.2% when HY CBOs are included. The historical average downgrade rate, weighted by the number of notches downgraded, was 29.6% for US CDOs excluding HY CBOs. This is substantially lower than the 50.0% weighted downgrade rate for CDOs that include HY CBOs.

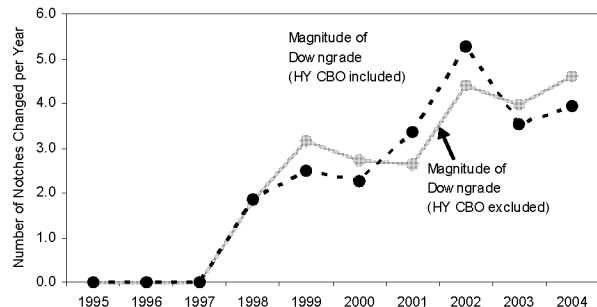
The historical average rating stability rate was 92.1% for CDOs excluding HY CBOs, compared to 87.3% when HY CBOs are included. The average rating drift was -48.9% and -28.4% for CDOs with and without HY CBOs (Figure 38).

Resecuritization CDOs accounted for more than 80% of the 2004 downgrades in CDOs outside of HY CBOs. The magnitude of rating downgrades in 2004 was 4.6 for CDOs excluding HY CBOs, higher than the average magnitude of 4.0 notches once HY CBOs are included. Because of the large magnitude of downgrades in CDOs outside of HY CBOs, particularly in res securitization deals, in 2003 and 2004, the historical average magnitude of downgrades was similar with and without HY CBOs. This suggests that HY CBOs, having experienced significant distress prior to 2003, were neutral to the US CDO ratings transitions performance in 2004.

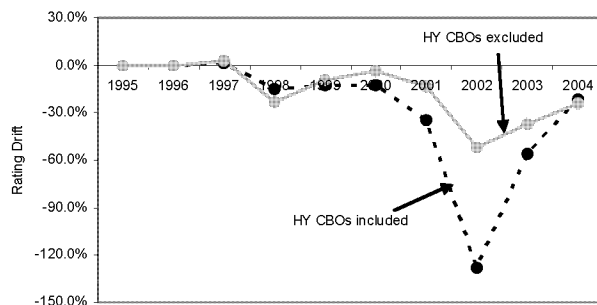
**Figure 36**  
Comparison of Downgrade Rates of US CDOs with and without HY CBOs



**Figure 37**  
Comparison of Magnitude of Downgrades of US CDOs with and without HY CBOs



**Figure 38**  
Comparison of Rating Drift of US CDOs with and without HY CBOs



**Figure 39**  
Annual Transition Rates of US CDOs without HY CBOs

|                                    | 1991-2004 | 2004   | 2003   |
|------------------------------------|-----------|--------|--------|
| Downgrade Rate                     | 7.3%      | 5.3%   | 10.0%  |
| Upgrade Rate                       | 0.6%      | 0.2%   | 1.1%   |
| Downgrade Rate (notch weighted)    | 29.6%     | 24.2%  | 39.6%  |
| Upgrade Rate (notch weighted)      | 1.2%      | 0.3%   | 2.6%   |
| Rating Drift (notch weighted)      | -28.4%    | -24.0% | -37.0% |
| Rating Volatility (notch weighted) | 30.7%     | 24.5%  | 42.3%  |
| Stability Rate                     | 92.1%     | 94.6%  | 88.9%  |
| Withdrawal Rate                    | 4.8%      | 5.6%   | 4.6%   |

## US CMBS

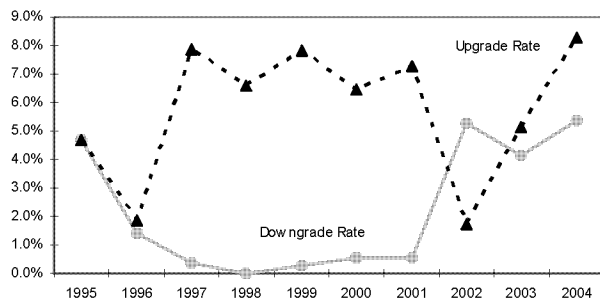
Out of a total universe of 3,278 US CMBS ratings at the beginning of 2004, 169 ratings from 45 deals were downgraded and 261 ratings from 73 deals were upgraded in 2004. The downgrade rate went up to 5.4%, from 4.1% in 2003 (Figure 40 and Figure 43). The upgrade rate grew to 8.3%, from 5.1% in 2003.

The downgrades of US CMBS securities that occurred in 2004 were prompted by poor collateral pool performance, higher-than-expected realized and anticipated losses from specially serviced loans, increased Loan-to-Value (LTV), or LTV dispersion.<sup>18</sup>

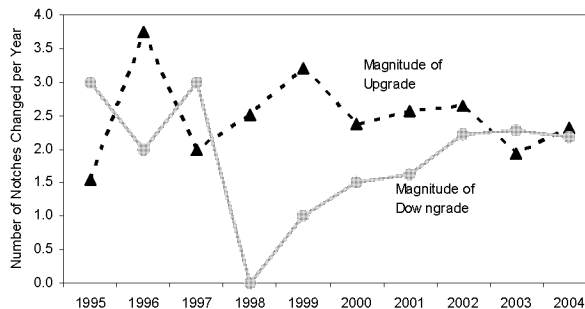
CMBS upgrades in 2004 were the result of significant increases in subordination levels due to payoffs, amortization and over-collateralization, as well as strong collateral pool performance.

The magnitude of downgrades was 2.2 in 2004, roughly the same as in 2003, while the magnitude of upgrades rose to 2.3 from 1.9 in the prior year (Figure 41). The increased downgrade and upgrade activities caused the US CMBS' ratings stability rate to decline to 86.3% from 90.7% in 2003. This marked the first time since 1993 that the CMBS sector's ratings stability rate fell below 90% (Figure 43). The weighted downgrade-to-upgrade ratio was 0.6:1 in 2004, down from 0.9:1 in 2003 (Figure 42).

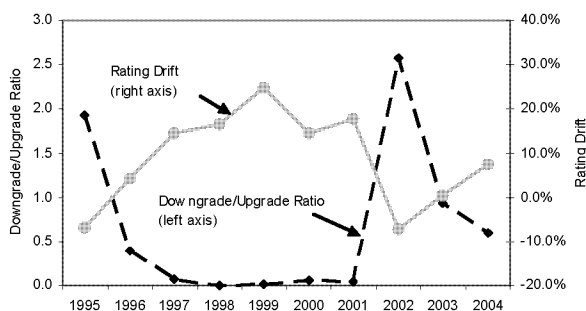
**Figure 40**  
**US CMBS Downgrade Rates and Upgrade Rates**



**Figure 41**  
**Magnitude of US CMBS Downgrades and Upgrades**



**Figure 42**  
**US CMBS Rating Drift and Downgrade-to-Upgrade Ratios (Weighted by Notches Changed)**



**Figure 43**  
**US CMBS Annual Transition Rates**

|                                    | 1991-2004 | 2004  | 2003  |
|------------------------------------|-----------|-------|-------|
| Downgrade Rate                     | 3.5%      | 5.4%  | 4.1%  |
| Upgrade Rate                       | 5.8%      | 8.3%  | 5.1%  |
| Downgrade Rate (notch weighted)    | 8.3%      | 11.7% | 9.4%  |
| Upgrade Rate (notch weighted)      | 13.9%     | 19.3% | 10.0% |
| Rating Drift (notch weighted)      | 5.6%      | 7.6%  | 0.6%  |
| Rating Volatility (notch weighted) | 22.2%     | 31.0% | 19.3% |
| Stability Rate                     | 90.7%     | 86.3% | 90.7% |
| Withdrawal Rate                    | 6.6%      | 7.9%  | 6.9%  |

<sup>18</sup> See also "U.S. CMBS 3Q 2004: Conduit Lending Remains 'Frothy' But a Few Bright Spots Emerge," October 2004.

Weighted by the magnitude of downgrades, the downgrade rate moved up to 11.7% from 9.4% in 2003, while the weighted upgrade rate doubled to 19.3% from its 2003 level (Figure 43). As a result, the number of notches moved drifted up 7.6% as a share of all outstanding ratings at the beginning of 2004, higher than both the 0.6% positive rating drift observed in 2003 and the 5.6% historical average.

## US RMBS

Out of a total universe of 5,465 US RMBS ratings at the beginning of 2004, just four ratings from three deals were downgraded, whereas 414 ratings from 123 deals were upgraded in 2004. The RMBS downgrade rate was less than 0.1%, and has stayed below 1% for five consecutive years since 2000 (Figure 44 and Figure 47). The upgrade rate rose to 7.9%, from 5.2% in 2003.

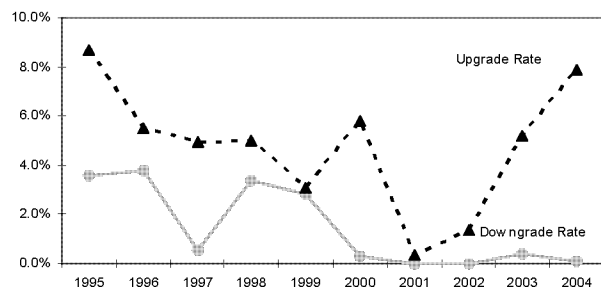
Three of the four RMBS downgrades were prompted by write-downs in the most junior tranches of the transactions, which further decreased credit support. The remaining security was downgraded because of low credit enhancement levels relative to its projected losses.

On September 1, 2004, Moody's upgraded 398 jumbo RMBS tranches from 115 deals. The rating actions followed Moody's examination of "jumbo" mortgage deals rated from 1998 through 2003. The examination was prompted by the unusually strong mortgage credit environment, which included rapid industry-wide prepayment speeds and generally rising home prices.<sup>19</sup>

The average number of notches downgraded in 2004 was 4.5, lower than the 6.3 average, while the magnitude of upgrades remained the same at 2.8 relative to the prior year (Figure 45). The rating drift was a positive 21.9% in 2004 (Figure 46), while the weighted downgrade-to-upgrade ratio was merely 0.01:1 in 2004.

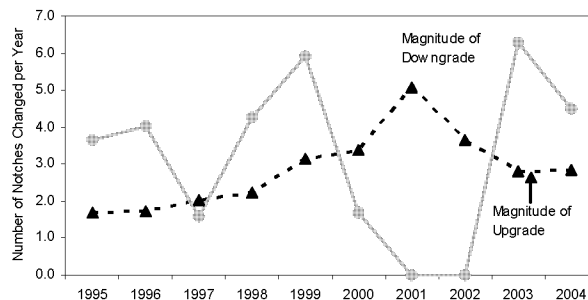
**Figure 44**

**US RMBS Downgrade Rates and Upgrade Rates**



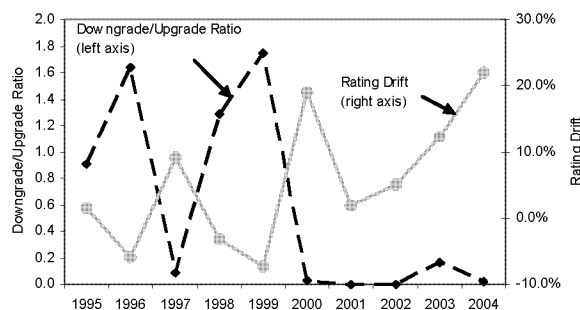
**Figure 45**

**Magnitude of US RMBS Downgrades and Upgrades**



**Figure 46**

**US RMBS Rating Drift and Downgrade-to-Upgrade Ratios (Weighted by Notches Changed)**



**Figure 47**

**US RMBS Annual Transition Rates**

|                                    | 1991-2004 | 2004  | 2003  |
|------------------------------------|-----------|-------|-------|
| Downgrade Rate                     | 1.9%      | 0.1%  | 0.4%  |
| Upgrade Rate                       | 4.9%      | 7.9%  | 5.2%  |
| Downgrade Rate (notch weighted)    | 6.7%      | 0.3%  | 2.4%  |
| Upgrade Rate (notch weighted)      | 12.0%     | 22.3% | 14.6% |
| Rating Drift (notch weighted)      | 5.3%      | 21.9% | 12.2% |
| Rating Volatility (notch weighted) | 18.7%     | 22.6% | 17.1% |
| Stability Rate                     | 93.2%     | 92.1% | 94.4% |
| Withdrawal Rate                    | 7.8%      | 7.2%  | 22.2% |

19 See "Moody's Upgrade 398 Jumbo Residential MBS Tranches," Moody's Structured Finance Rating Action Report, September 1, 2004.

## Regional Comparisons Of Rating Transitions

### EUROPEAN AND U.S. RATING TRANSITION RATES

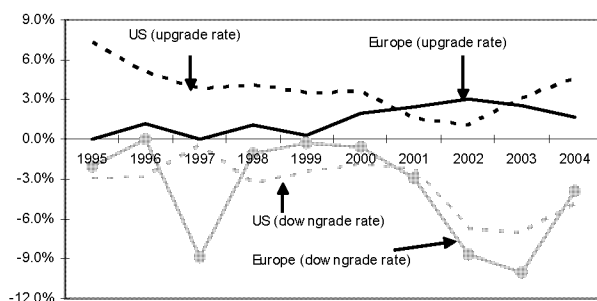
Out of a total universe of 2,968 European structured finance ratings at the beginning of 2004, 111 ratings from 70 deals were downgraded and 49 ratings from 33 deals were upgraded in 2004. The downgrade rate dropped to 3.9% from 10.0%, and the upgrade rate declined to 1.7%, from 2.5% in 2003 (see Figure 48, where the downgrade rates are marked to be negative for chart clarity).<sup>20</sup> The downgrade and upgrade rates in Europe were both lower than those in the US in 2004, which were 4.9% and 4.6%, respectively (Figure 50).

About 75.7% of the structured finance downgrades in Europe in 2004 occurred in the CDO sector, and a substantial portion involved synthetic arbitrage deals. Some of the downgrades stemmed from the exposure of the deals' reference pools to Parmalat SpA credit, which defaulted in 2003. Downgrades were also observed in the ABS, CMBS and RMBS sectors. Some of these downgrades were the result of the rating downgrade of a third party. The number of downgrades in Europe in 2004 was roughly half that in 2003.

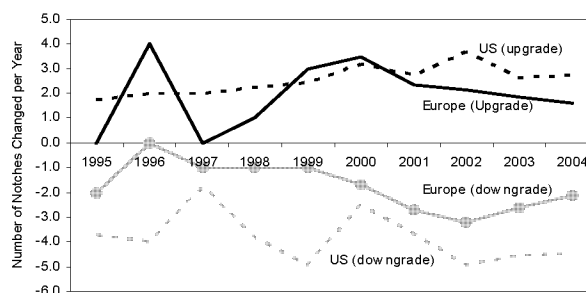
Additionally, the average number of notches downgraded was 2.1 in 2004, lower than the 2.6 in 2003, while the magnitude of upgrades decreased slightly to 1.6 from 1.8 in the prior year (Figure 49). The magnitude of downgrades per year has been consistently lower in European structured finance than in US structured finance since 1995, the same is true of the magnitude of upgrades, except in 1999 and 2000 (Figure 49).

The rating stability rate in Europe went up to 94.4% in 2004 from 87.4% in 2003, while the weighted downgrade-to-upgrade ratio shrank to 2.9:1, from 5.7:1 in 2003 (Figure 50).

**Figure 48**  
Comparison of Downgrade Rates and Upgrade Rates between European and US Structured Finance



**Figure 49**  
Comparison of Magnitude of Downgrades and Upgrades between European and US Structured Finance



**Figure 50 - Comparison of Annual Rating Transition Rates between European and US Structured Finance**

|                                    | Europe    |       |        | US        |       |        |
|------------------------------------|-----------|-------|--------|-----------|-------|--------|
|                                    | 1991-2004 | 2004  | 2003   | 1991-2004 | 2004  | 2003   |
| Downgrade Rate                     | 5.8%      | 3.9%  | 10.0%  | 4.3%      | 4.9%  | 7.0%   |
| Upgrade Rate                       | 2.1%      | 1.7%  | 2.5%   | 3.5%      | 4.6%  | 3.1%   |
| Downgrade Rate (notch weighted)    | 14.9%     | 8.2%  | 26.4%  | 17.9%     | 22.0% | 31.8%  |
| Upgrade Rate (notch weighted)      | 4.3%      | 2.8%  | 4.7%   | 8.8%      | 12.7% | 8.2%   |
| Rating Drift (notch weighted)      | -10.6%    | -5.4% | -21.7% | -9.0%     | -9.3% | -23.5% |
| Rating Volatility (notch weighted) | 19.1%     | 11.0% | 31.1%  | 26.7%     | 34.6% | 40.0%  |
| Stability Rate                     | 92.0%     | 94.4% | 87.4%  | 92.2%     | 90.5% | 89.9%  |
| Withdrawn Rate                     | 6.5%      | 7.3%  | 5.9%   | 7.2%      | 6.3%  | 12.2%  |

<sup>20</sup> More detailed 2004 rating transition experiences in European structured finance will be published separately. See also "Europe, Middle East and Africa Structured Finance Rating Transitions: 2003 Update," February 2004.

When weighted by the number of notches downgraded, the downgrade rate in Europe was 8.2% in 2004, about a third of the 22.0% weighted downgrade rate in the US. The weighted upgrade rate was also substantially lower in Europe than in the US (Figure 50). As a result, European structured ratings drifted negatively, by -5.4% as a share of all outstanding ratings, which was less than the negative rating drift of -9.3% in US structured finance.

Figure 51 compares the 2004 rating transition matrices in Europe and the US. It shows superior rating stability in Europe in almost all rating categories (except for the Aaa category, which is similar in Europe and the US), and much lower transition rates into the Caa or below category.

| <b>Figure 51 - Comparison of European and US Structured Finance Annual Rating Transition Matrices</b> |            |                    |          |            |           |          |                     |
|---|------------|--------------------|----------|------------|-----------|----------|---------------------|
| <b>Europe in 2004</b>   |            | <b>Ratings to:</b> |          |            |           |          |                     |
| <b>Ratings from:</b>  | <b>Aaa</b> | <b>Aa</b>          | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa or below</b> |
| Aaa   | 98.98%     | 0.68%              | 0.34%    |            |           |          |                     |
| Aa  | 0.90%      | 96.41%             | 2.51%    | 0.18%      |           |          |                     |
| A   | 0.30%      | 1.20%              | 96.40%   | 1.35%      | 0.75%     |          |                     |
| Baa   |            |                    | 1.55%    | 95.72%     | 2.53%     |          | 0.19%               |
| Ba  |            |                    |          | 0.58%      | 95.91%    | 2.92%    | 0.58%               |
| B   |            |                    |          |            | 2.67%     | 84.00%   | 13.33%              |
| Caa or below  |            |                    |          |            |           |          | 100.00%             |
| <b>U.S. in 2004</b>   |            | <b>Ratings to:</b> |          |            |           |          |                     |
| <b>Ratings from:</b>  | <b>Aaa</b> | <b>Aa</b>          | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa or below</b> |
| Aaa   | 99.11%     | 0.29%              | 0.23%    | 0.11%      | 0.13%     | 0.10%    | 0.03%               |
| Aa  | 7.77%      | 89.18%             | 1.35%    | 0.46%      | 0.23%     | 0.39%    | 0.62%               |
| A   | 1.53%      | 5.14%              | 90.35%   | 1.68%      | 0.51%     | 0.21%    | 0.57%               |
| Baa   | 0.27%      | 1.10%              | 3.98%    | 89.62%     | 2.59%     | 0.89%    | 1.55%               |
| Ba  | 0.23%      | 0.30%              | 1.20%    | 3.31%      | 84.64%    | 4.44%    | 5.87%               |
| B   |            |                    | 0.12%    | 0.24%      | 3.88%     | 80.00%   | 15.76%              |
| Caa or below  |            |                    |          |            |           | 0.15%    | 99.85%              |

## ASIA PACIFIC AND U.S. RATING TRANSITION RATES

Out of a total universe of 1,064 Asia Pacific structured finance ratings at the beginning of 2004, only three ratings from three deals were downgraded and 66 ratings from 43 deals were upgraded in 2004. The downgrade rate declined to 0.3% from 2.3%, and the upgrade rate ran up to 6.8%, from 3.0% in 2003 (see Figure 52, where the downgrade rates are marked to be negative for chart clarity).<sup>21</sup> The downgrade rate in 2004 was significantly lower, while the upgrade rate was higher, in the Asia Pacific region than in the US (Figure 54).

Upgrades in the Asia Pacific region were almost equally distributed across the four broad structured finance sectors. Most of the upgrades were the result of strong collateral pool performance and credit enhancement build-up, especially in the ABS and CMBS sectors. Some of the RMBS upgrades were attributable to the upgrade of a mortgage insurer and a mortgage servicer as well as the reevaluation of commingling risk in the collateral pool. Two ABS upgrades came about due to the upgrade of a foreign currency rating and a local currency's guideline.

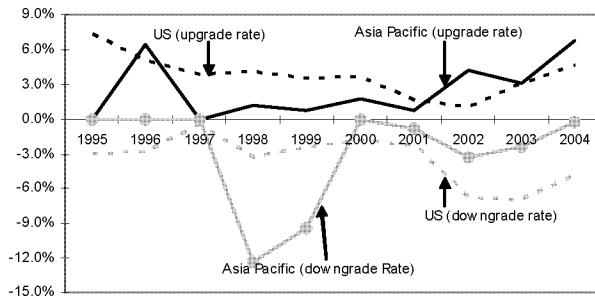
The average number of notches downgraded decreased to 1.7 in 2004, from 2.9 in 2003, while the magnitude of upgrades increased slightly to 2.6, from 2.4 in the prior year (Figure 53). Similar to the contrast in the magnitude of downgrades in Europe and the US, the downgrade magnitude in the Asia Pacific region has also been consistently lower, by about two notches, than in US structured finance. The magnitude of upgrades was lower in the Asia Pacific region than that in the US as well (Figure 53).

As a result of high upgrade rates in 2004, the rating stability rate in Asia Pacific decreased to 92.9%, from 94.6% in 2003, while the weighted downgrade-to-upgrade ratio shrank to 0.03:1, from 0.9:1 (Figure 54).

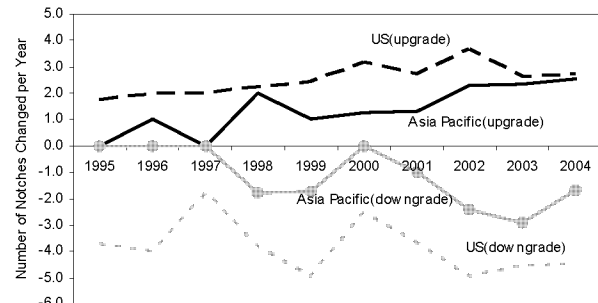
<sup>21</sup> More detailed 2004 rating transition experiences in Japanese structured finance will be published separately. See also "Japanese Structured Finance Rating Transitions: 1998-2003," April 2004.



**Figure 52**  
**Comparison of Downgrade Rates and Upgrade Rates between Asia Pacific and US Structured Finance**



**Figure 53**  
**Comparison of Magnitude of Downgrades and Upgrades between Asia Pacific and US Structured Finance**



**Figure 54 - Comparison of Annual Rating Transition Rates between Asia Pacific and US Structured Finance**

|                                    | Asia Pacific |       |       | US        |       |        |
|------------------------------------|--------------|-------|-------|-----------|-------|--------|
|                                    | 1991-2004    | 2004  | 2003  | 1991-2004 | 2004  | 2003   |
| Downgrade Rate                     | 1.9%         | 0.3%  | 2.3%  | 4.3%      | 4.9%  | 7.0%   |
| Upgrade Rate                       | 3.8%         | 6.8%  | 3.0%  | 3.5%      | 4.6%  | 3.1%   |
| Downgrade Rate (notch weighted)    | 4.2%         | 0.5%  | 6.8%  | 17.9%     | 22.0% | 31.8%  |
| Upgrade Rate (notch weighted)      | 9.1%         | 17.3% | 7.2%  | 8.8%      | 12.7% | 8.2%   |
| Rating Drift (notch weighted)      | 4.8%         | 16.8% | 0.4%  | -9.0%     | -9.3% | -23.5% |
| Rating Volatility (notch weighted) | 13.3%        | 17.8% | 14.0% | 26.7%     | 34.6% | 40.0%  |
| Stability Rate                     | 94.2%        | 92.9% | 94.6% | 92.2%     | 90.5% | 89.9%  |
| Withdrawn Rate                     | 12.5%        | 17.4% | 12.9% | 7.2%      | 6.3%  | 12.2%  |

Figure 55 compares the 2004 rating transition matrices in the Asia Pacific region to those of the US. The comparisons show much better rating stability in the Asia Pacific region in all rating categories except for the single-A and Baa rating categories, given their significantly higher upgrade rates than those in the US. In addition, there was not a single rating transition into the Caa or below rating category in the Asia Pacific region in 2004.

**Figure 55 - Comparison of Asia Pacific and US Structured Finance Annual Rating Transition Matrices**

| Asia Pacific in 2004 |        | Ratings to: |        |        |        |         |              |  |
|----------------------|--------|-------------|--------|--------|--------|---------|--------------|--|
| Ratings from:        | Aaa    | Aa          | A      | Baa    | Ba     | B       | Caa or below |  |
| Aaa                  | 99.78% | 0.22%       |        |        |        |         |              |  |
| Aa                   | 9.69%  | 90.31%      |        |        |        |         |              |  |
| A                    | 4.86%  | 6.69%       | 88.45% |        |        |         |              |  |
| Baa                  | 1.71%  | 0.85%       | 7.69%  | 88.89% | 0.85%  |         |              |  |
| Ba                   |        |             |        | 2.47%  | 97.53% |         |              |  |
| B                    |        |             |        |        |        | 100.00% |              |  |
| Caa or below         |        |             |        |        |        |         | 100.00%      |  |

| U.S. in 2004  |        | Ratings to: |        |        |        |        |              |  |
|---------------|--------|-------------|--------|--------|--------|--------|--------------|--|
| Ratings from: | Aaa    | Aa          | A      | Baa    | Ba     | B      | Caa or below |  |
| Aaa           | 99.11% | 0.29%       | 0.23%  | 0.11%  | 0.13%  | 0.10%  | 0.03%        |  |
| Aa            | 7.77%  | 89.18%      | 1.35%  | 0.46%  | 0.23%  | 0.39%  | 0.62%        |  |
| A             | 1.53%  | 5.14%       | 90.35% | 1.68%  | 0.51%  | 0.21%  | 0.57%        |  |
| Baa           | 0.27%  | 1.10%       | 3.98%  | 89.62% | 2.59%  | 0.89%  | 1.55%        |  |
| Ba            | 0.23%  | 0.30%       | 1.20%  | 3.31%  | 84.64% | 4.44%  | 5.87%        |  |
| B             |        |             | 0.12%  | 0.24%  | 3.88%  | 80.00% | 15.76%       |  |
| Caa or below  |        |             |        |        |        | 0.15%  | 99.85%       |  |

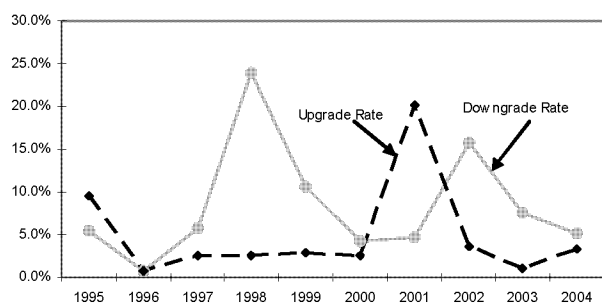
## Rating Transitions In The Credit Derivatives Sector

Out of a total universe of 1,478 global credit derivative ratings at the beginning of 2004, 74 ratings were downgraded and 47 ratings were upgraded by year's end. The downgrade rate declined to 5.2% from 7.6%, while the upgrade rate rose to 3.3%, from 1.1% in 2003 (Figure 56 and Figure 59). Almost all derivative downgrades and upgrades were in the structured notes and repackaged securities categories, and were triggered by the change of the reference credit's rating.

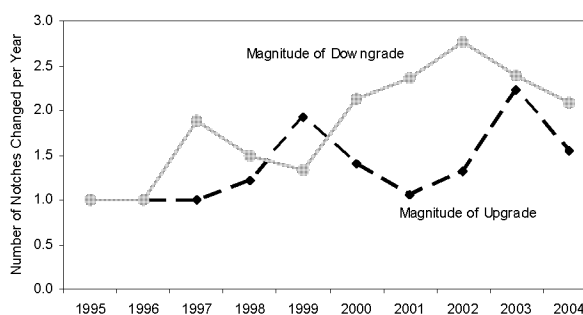
The average number of notches downgraded continued to fall from 2.4 in 2003 to 2.1 in 2004, while the magnitude of upgrades decreased to 1.6 in 2004 from 2.2 in the prior year (Figure 57).

The rating stability rate in the derivative sector was 91.5% in 2004, roughly the same as that in 2003. The negative rating drift was reduced to -5.7% from -15.8% (Figure 58 and Figure 59), while the weighted downgrade-to-upgrade ratio contracted to 2:1 from 7.4:1 in 2003.

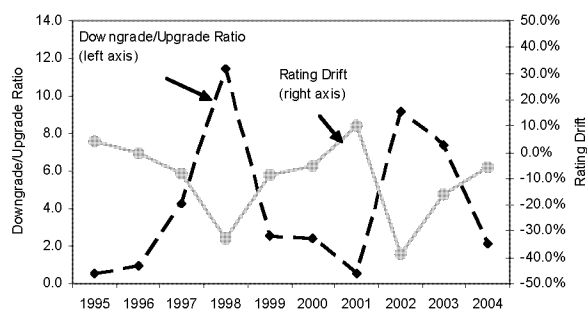
**Figure 56**  
Derivatives Downgrade Rates and Upgrade Rates



**Figure 57**  
Magnitude of Derivatives Downgrades and Upgrades



**Figure 58**  
Derivatives Rating Drift and Downgrade-to-Upgrade Ratio (weighted by Number of Notches Changed)



**Figure 59**  
Derivatives Annual Rating Transition Rates

|                                    | 1991-2004 | 2004  | 2003   |
|------------------------------------|-----------|-------|--------|
| Downgrade Rate                     | 8.5%      | 5.2%  | 7.6%   |
| Upgrade Rate                       | 4.7%      | 3.3%  | 1.1%   |
| Downgrade Rate (notch weighted)    | 18.6%     | 10.9% | 18.2%  |
| Upgrade Rate (notch weighted)      | 6.0%      | 5.1%  | 2.5%   |
| Rating Drift (notch weighted)      | -12.6%    | -5.7% | -15.8% |
| Rating Volatility (notch weighted) | 24.7%     | 16.0% | 20.7%  |
| Stability Rate                     | 86.8%     | 91.5% | 91.3%  |
| Withdrawal Rate                    | 10.3%     | 8.1%  | 8.5%   |

Ratings transitions in the derivatives sector are highly correlated with global corporate and sovereign ratings. Figure 60 compares 2004 rating transition matrices in the derivatives and corporate sectors, which had similar rating stability rates in the investment-grade rating categories and similar rating transition rates from Aa to single-A and from Ba to single-B. The rating transition rate from single-B to Ba was much higher, and those from Ba to Baa, and Baa to single-A, were much lower in the derivative sector than in the corporate sector.

| <b>Figure 60 - Comparison of Global Derivatives and Global Corporate Annual Rating Transition Matrices</b> |                    |           |          |            |           |          |                     |
|--|--------------------|-----------|----------|------------|-----------|----------|---------------------|
| <b>Derivatives in 2004</b>   | <b>Ratings to:</b> |           |          |            |           |          |                     |
| <b>Ratings from:</b>   | <b>Aaa</b>         | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa or below</b> |
| Aaa  | 100.00%            |           |          |            |           |          |                     |
| Aa   |                    | 97.88%    | 2.12%    |            |           |          |                     |
| A  |                    | 3.29%     | 95.06%   | 1.65%      |           |          |                     |
| Baa  |                    | 0.75%     | 1.12%    | 90.64%     | 5.99%     |          | 1.50%               |
| Ba   |                    |           |          | 1.22%      | 93.90%    | 4.88%    |                     |
| B  |                    |           |          |            | 20.59%    | 73.53%   | 5.88%               |
| Caa or below   |                    |           |          |            |           | 4.88%    | 95.12%              |
| <b>Corporate in 2004</b>   | <b>Ratings to:</b> |           |          |            |           |          |                     |
| <b>Ratings from:</b>   | <b>Aaa</b>         | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa or below</b> |
| Aaa  | 98.48%             | 1.52%     |          |            |           |          |                     |
| Aa   | 0.43%              | 97.10%    | 2.32%    | 0.14%      |           |          |                     |
| A  | 0.08%              | 3.18%     | 93.57%   | 3.18%      |           |          |                     |
| Baa  |                    | 0.08%     | 6.76%    | 89.86%     | 3.13%     | 0.17%    |                     |
| Ba   |                    |           | 0.18%    | 13.53%     | 81.79%    | 4.15%    | 0.36%               |
| B  |                    | 0.13%     | 0.13%    | 0.25%      | 10.14%    | 82.38%   | 6.97%               |
| Caa or below   |                    |           |          |            | 0.43%     | 10.39%   | 89.18%              |

## Appendix I: Data Sample Criteria And Glossary

---

### DATA SAMPLE CRITERIA

The data sample for this study uses the same set of criteria adopted in Moody's first and second global structured rating transition studies, published in January 2003 and February 2004, respectively.<sup>22</sup> The sample in this study covers all structured finance rating observations globally between 1983 and 2004.

Only structured securities with long-term bond ratings were included. Tranches wrapped by financial guarantors, government agencies, or government sponsored enterprises (GSEs) were excluded.

Tranches carrying the same rating from the same deal were collapsed into a single rating tranche, with two exceptions: where two or more tranches shared the same rating in the same deal, but were collateralized by distinct groups of loan pools, we did not collapse the tranches. In addition, we did not collapse interest-only (IO) or residual tranches even though they typically share the same rating with another tranche in a deal.

We also excluded deals that were entirely dependent on a single corporate rating, such as the single borrower credit tenant lease (CTL) deals. Derivative ratings, which are generally linked to another single credit rating, are analyzed separately in this report.

### GLOSSARY

#### *Downgrade (or Upgrade) Rate*

A security is downgraded (upgraded) if its rating at the end of a year is lower (higher) than at the beginning of the year on the basis of ratings with numeric modifiers (also known as refined ratings or modified ratings). The downgrade rate is the number of securities downgraded (or upgraded) divided by the total number of outstanding securities at the beginning of the year, after excluding *half of* the ratings withdrawn during the year.<sup>23</sup> Please note that in measuring downgrade rates and upgrade rates, only ratings at the beginning and the end of the year are considered.

#### *Weighted Downgrade (or Upgrade) Rate*

This term refers to the number of securities downgraded (or upgraded), weighted by the total number of notches changed per downgrade (upgrade) from the beginning to the end of a year, divided by the total number of outstanding securities at the beginning of the year, after excluding half of the ratings withdrawn during the year. For example, a security downgraded from Baa1 at the beginning of the year to Ba1 at the end of the year is counted as three downgrades to get a weighted-downgrade rate, but counted as only one downgrade to get the unweighted downgrade rate.

#### *Rating Stability Rate*

The number of securities that did not change ratings, on the basis of ratings with numeric modifiers, from the beginning to the end of the year, divided by the total number of outstanding securities at the beginning of the year, adjusted for ratings withdrawn during the year. Only ratings at the beginning and the end of the year are used.

#### *Broad Ratings and Refined Ratings*

Broad ratings refer to long-term bond rating categories: Aaa, Aa, A, Baa, Ba, B, and Caa or below. Refined ratings or ratings with numeric modifiers refer to Aaa, Aa1, Aa2, Aa3, A1, A2, A3, Baa1, Baa2, Baa3, Ba1, Ba2, Ba3, B1, B2, B3, Caa1, Caa2, Caa3, Ca, and C. The broad rating category Caa or below includes the following refined ratings: Caa1, Caa2, Caa3, Ca, and C.

#### *Average Number of Total Notches Downgraded (Upgraded) per Year*

This refers to the number of total notches downgraded (upgraded) over an entire year, averaged across all securities downgraded (upgraded) during the year. A security can experience multiple rating actions during the year. Therefore, this measure is different from the number of notches changed per rating *action*.

---

<sup>22</sup> See Moody's Special Comments, "Structured Finance Rating Transitions: 1983-2002, Comparisons with Corporate Ratings and Across Sectors," January 2003, and "Structured Finance Rating Transition: 1983-2003," February 2004.

<sup>23</sup> Moody's typically calculates structured finance and corporate finance default rates by deducting half of the withdrawn ratings from the rating population outstanding at the beginning of a cohort year. To be consistent, we do the same for the calculation of downgrade rate and upgrade rate in our transition studies, and will adopt this as the standard method in all of our transition/default reports.

### ***Rating Drift***

The weighted upgrade rate minus the weighted downgrade rate.

### ***Rating Volatility***

The weighted upgrade rate plus the weighted downgrade rate.

### ***Downgrade-to-Upgrade Ratio***

This refers to the total number of downgraded ratings divided by the total number of upgraded ratings. The weighted downgrade-to-upgrade ratio, or downgrade-to-upgrade ratio weighted by the number of notches changed, computes the ratio of the weighted downgrades and upgrades.

### ***Downgrade (Upgrade) Rate by Broad Rating***

A downgrade (upgrade) occurs only if a security changes its rating across two broad rating categories. For example, a rating change from Baa1 to Ba2 is considered a downgrade by broad rating. A rating change from Baa1 to Baa3 is not counted as a downgrade by broad rating, but is considered to be a downgrade by refined rating (this is the standard case).

### ***Cohort***

A cohort contains all rated securities outstanding at the beginning of a year regardless of when a security was issued. The length of a cohort is the number of years during which a security's rating will be examined. For example, a one-year cohort is formed for the purpose of examining rating changes over a one-year period. A three-year cohort is formed for the purpose of examining rating changes over a three-year period. Only the ratings outstanding at the beginning and end of the three-year period are used.

### ***Rating Transition Matrix***

A one-year rating transition matrix specifies the frequencies of ratings changed from a starting rating category at the beginning of a year to an end rating category at the end of a year (typically by broad rating). A multi-year rating transition matrix reports the frequencies of ratings changed from a starting rating category at the beginning of a multi-year cohort to an end rating category at the end of the multi-year cohort (typically by broad rating).

### ***ABS***

This refers to Asset-Backed-Securities. This structured finance sector includes securities backed by home-equity loans (HEL) in addition to both traditional (autos, credit cards, leases, manufactured housing, student loans, etc.) and non-traditional (mutual fund fees, tax liens, tobacco settlement, whole business securitizations (ABS), etc) asset classes.

### ***HELs***

HELs include securities collateralized by subprime (B&C) mortgage loans, home improvement loans, high loan-to-value (high LTV) loans, home equity lines of credit (HELOs), closed-end second-lien loans, and net interest margin (NIM) securitizations. It does not include "Alt-A" mortgages, which are part of the RMBS sector. HEL is part of the ABS sector.

### ***CDOs***

This refers to collateralized debt obligations. Derivative securities such as repackaged securities, structured notes, and credit derivatives are not considered to be part of this sector.

### ***CMBS***

This refers to commercial mortgage-backed securities.

### ***RMBS***

This refers to residential mortgage-backed securities. The large majority of these securities are backed by first-lien prime mortgages. Some are backed by Alt-A mortgages. HEL is not part of this sector.

## ***Derivatives***

This sector contains structured notes, repackaged securities, and credit derivatives. Structured covered bonds, catastrophe linked notes, and structured investment vehicles are also included in this sector (this sector was called “Others” in our first transition study in 2003).

## ***All structured finance***

This includes global structured securities in four major sectors: ABS, CDO, CMBS, and RMBS. We exclude the derivatives sector from this term to better capture rating transition experiences among core structured finance securities by isolating the influence from corporate rating transitions on structured finance as a whole.

## ***U.S. Structured Finance Securities***

This refers to structured finance securities denominated in U.S. dollars and issued in the U.S. market.

## ***European Structured Finance Securities***

This includes securities denominated in a European currency or issued in a European country.

## ***Asia Pacific Structured Finance Securities***

This includes securities denominated in an Asia-Pacific region currency or issued in an Asia-Pacific country that includes Japan and Australia.

## **TREATMENT OF WITHDRAWN RATINGS (WR)**

The rating downgrade rate and upgrade rate reported in this *Special Comment* have been adjusted for withdrawn ratings by deducting *half* of the ratings withdrawn during the year from the total number of outstanding ratings at the beginning of the year. This assumes rating withdrawals occur gradually (uniformly distributed) over the year. In the two previous transition studies, we have deducted all withdrawn ratings from the population. The treatment of withdrawn ratings adopted in this report is consistent with Moody’s standard default rate calculations, which typically remove half of the withdrawn ratings from the number of ratings outstanding at the beginning of each year. Consequently, this withdrawal adjustment method will be adopted as the standard method in all of future transition and default studies.

Meanwhile, the frequency of ratings remain unchanged, also known as the rating stability rate, is one minus the sum of all transition rates into different rating categories.

For example, let  $TR(\text{Baa} \rightarrow \text{Ba})$  be the transition rate from a Baa rating to a Ba rating unadjusted for the Baa ratings that were withdrawn during the year. Let  $TR^*(\text{Baa} \rightarrow \text{Ba})$  be the transition rate adjusted for withdrawals. Let  $WR(\text{Baa})$  be the withdrawal rate of the Baa rating category. Then,

$$TR^*(\text{Baa} \rightarrow \text{Ba}) = TR(\text{Baa} \rightarrow \text{Ba}) / (1 - \frac{1}{2} * WR)$$

The rating stability rate adjusted for rating withdrawals,  $SR^*(\text{Baa} \rightarrow \text{Baa})$ , is simply:

$$SR^*(\text{Baa} \rightarrow \text{Baa}) = 1 - TR^*(\text{Baa} \rightarrow \text{Aaa}) - TR^*(\text{Baa} \rightarrow \text{Aa}) - TR^*(\text{Baa} \rightarrow \text{A}) - TR^*(\text{Baa} \rightarrow \text{Ba}) - TR^*(\text{Baa} \rightarrow \text{B}) - TR^*(\text{Baa} \rightarrow \text{Caa or below})$$

In the appendix to follow, transition matrices of all time horizons<sup>24</sup> contain a column (the last column, WR) of frequencies of rating withdrawn, by rating. This ensures a complete account of rating transitions. The adjustment formula described above is applicable to all cohort horizons.

---

24 The only exception is Figure 72, which shows 2004 rating transition matrices by sector, adjusted for withdrawn ratings.

## Appendix II: Transition Matrices

**Figure 61 - Global Structured Finance Rating Transition Matrices (Weighted Averages, 1983-2004)**

| 1-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
|---------------|--------|--------|--------|--------|--------|--------|--------------|--------|
| Aaa           | 89.82% | 0.61%  | 0.18%  | 0.07%  | 0.03%  | 0.02%  | 0.04%        | 9.24%  |
| Aa            | 5.86%  | 85.21% | 1.97%  | 0.69%  | 0.18%  | 0.13%  | 0.16%        | 5.80%  |
| A             | 1.13%  | 2.82%  | 86.42% | 1.91%  | 0.64%  | 0.27%  | 0.29%        | 6.53%  |
| Baa           | 0.43%  | 0.62%  | 2.49%  | 85.02% | 3.28%  | 1.40%  | 1.34%        | 5.42%  |
| Ba            | 0.15%  | 0.11%  | 0.74%  | 3.46%  | 81.60% | 3.46%  | 6.05%        | 4.43%  |
| B             | 0.06%  | 0.00%  | 0.09%  | 0.49%  | 1.97%  | 82.42% | 11.23%       | 3.74%  |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.05%  | 0.16%  | 90.81%       | 8.98%  |
| <b>2-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 78.53% | 1.10%  | 0.35%  | 0.17%  | 0.08%  | 0.06%  | 0.10%        | 19.60% |
| Aa            | 10.18% | 70.51% | 3.27%  | 1.46%  | 0.51%  | 0.27%  | 0.45%        | 13.35% |
| A             | 2.40%  | 4.40%  | 73.16% | 2.71%  | 1.20%  | 0.56%  | 0.95%        | 14.61% |
| Baa           | 0.88%  | 1.24%  | 4.11%  | 71.11% | 4.45%  | 2.50%  | 3.67%        | 12.04% |
| Ba            | 0.26%  | 0.23%  | 1.61%  | 4.37%  | 67.42% | 4.52%  | 11.57%       | 10.02% |
| B             | 0.04%  | 0.00%  | 0.11%  | 1.01%  | 2.68%  | 69.73% | 16.08%       | 10.35% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.16%  | 0.55%  | 80.78%       | 18.51% |
| <b>3-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 68.02% | 1.24%  | 0.45%  | 0.25%  | 0.11%  | 0.08%  | 0.18%        | 29.68% |
| Aa            | 14.33% | 57.58% | 3.68%  | 1.91%  | 0.85%  | 0.52%  | 0.71%        | 20.44% |
| A             | 3.42%  | 5.31%  | 61.35% | 2.48%  | 1.23%  | 0.71%  | 1.55%        | 23.94% |
| Baa           | 1.24%  | 1.58%  | 5.27%  | 60.12% | 4.36%  | 3.09%  | 6.88%        | 17.47% |
| Ba            | 0.44%  | 0.49%  | 2.13%  | 5.41%  | 56.38% | 4.18%  | 15.13%       | 15.85% |
| B             | 0.10%  | 0.00%  | 0.20%  | 1.47%  | 1.57%  | 60.57% | 18.88%       | 17.21% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.39%  | 0.65%  | 72.09%       | 26.87% |
| <b>4-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 58.95% | 1.14%  | 0.45%  | 0.23%  | 0.10%  | 0.07%  | 0.24%        | 38.82% |
| Aa            | 18.28% | 46.30% | 3.85%  | 1.88%  | 0.85%  | 0.63%  | 0.89%        | 27.32% |
| A             | 4.55%  | 6.17%  | 50.52% | 1.98%  | 1.08%  | 0.70%  | 1.77%        | 33.23% |
| Baa           | 1.87%  | 2.07%  | 6.18%  | 51.55% | 4.42%  | 2.93%  | 8.49%        | 22.49% |
| Ba            | 0.67%  | 0.74%  | 3.12%  | 7.00%  | 46.62% | 3.57%  | 15.75%       | 22.54% |
| B             | 0.20%  | 0.00%  | 0.26%  | 2.17%  | 1.77%  | 51.87% | 19.89%       | 23.83% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.72%  | 0.90%  | 65.89%       | 32.50% |
| <b>5-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 50.59% | 1.00%  | 0.41%  | 0.21%  | 0.07%  | 0.06%  | 0.21%        | 47.44% |
| Aa            | 21.25% | 36.64% | 3.50%  | 1.75%  | 0.70%  | 0.69%  | 1.05%        | 34.42% |
| A             | 5.89%  | 6.50%  | 40.42% | 1.62%  | 0.83%  | 0.55%  | 1.56%        | 42.63% |
| Baa           | 2.72%  | 2.65%  | 7.29%  | 43.30% | 3.77%  | 2.65%  | 9.90%        | 27.72% |
| Ba            | 0.96%  | 1.20%  | 4.26%  | 8.80%  | 38.56% | 2.82%  | 13.44%       | 29.95% |
| B             | 0.36%  | 0.00%  | 0.27%  | 3.03%  | 1.96%  | 43.98% | 18.73%       | 31.67% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 1.03%  | 1.03%  | 60.31%       | 37.63% |

**Figure 62 - US ABS Rating Transition Matrices (Weighted Averages, 1983-2004)**

| 1-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
|---------------|--------|--------|--------|--------|--------|--------|--------------|--------|
| Aaa           | 88.70% | 0.70%  | 0.29%  | 0.12%  | 0.07%  | 0.05%  | 0.08%        | 9.98%  |
| Aa            | 2.41%  | 88.06% | 2.09%  | 1.11%  | 0.46%  | 0.28%  | 0.52%        | 5.07%  |
| A             | 0.72%  | 1.17%  | 87.74% | 1.79%  | 0.86%  | 0.41%  | 0.32%        | 7.01%  |
| Baa           | 0.46%  | 0.39%  | 0.87%  | 85.84% | 4.25%  | 1.76%  | 1.99%        | 4.44%  |
| Ba            | 0.41%  | 0.21%  | 0.28%  | 4.13%  | 71.18% | 5.43%  | 14.72%       | 3.65%  |
| B             | 0.00%  | 0.00%  | 0.20%  | 0.60%  | 0.60%  | 66.87% | 29.54%       | 2.20%  |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.18%  | 88.97%       | 10.86% |
| <b>2-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 75.29% | 1.15%  | 0.45%  | 0.31%  | 0.21%  | 0.16%  | 0.20%        | 22.22% |
| Aa            | 4.76%  | 74.64% | 3.10%  | 2.07%  | 1.11%  | 0.72%  | 1.58%        | 12.02% |
| A             | 1.47%  | 1.89%  | 75.07% | 2.31%  | 1.16%  | 0.81%  | 1.35%        | 15.94% |
| Baa           | 1.09%  | 0.72%  | 1.64%  | 72.34% | 5.64%  | 3.18%  | 5.24%        | 10.16% |
| Ba            | 0.70%  | 0.44%  | 0.61%  | 1.05%  | 57.78% | 4.72%  | 26.75%       | 7.95%  |
| B             | 0.28%  | 0.00%  | 0.56%  | 1.13%  | 1.13%  | 54.52% | 34.18%       | 8.19%  |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.38%  | 69.43%       | 30.19% |
| <b>3-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 61.07% | 1.17%  | 0.42%  | 0.41%  | 0.24%  | 0.18%  | 0.30%        | 36.19% |
| Aa            | 6.88%  | 62.95% | 3.44%  | 1.90%  | 1.20%  | 1.54%  | 2.27%        | 19.83% |
| A             | 1.68%  | 2.03%  | 63.69% | 2.06%  | 1.12%  | 0.74%  | 1.90%        | 26.79% |
| Baa           | 1.15%  | 0.91%  | 1.92%  | 60.42% | 6.27%  | 3.81%  | 9.14%        | 16.39% |
| Ba            | 0.93%  | 0.81%  | 0.93%  | 1.04%  | 47.10% | 4.52%  | 31.32%       | 13.34% |
| B             | 0.79%  | 0.00%  | 1.19%  | 1.58%  | 1.58%  | 47.43% | 30.83%       | 16.60% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 47.66%       | 52.34% |
| <b>4-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 47.38% | 0.96%  | 0.45%  | 0.38%  | 0.21%  | 0.15%  | 0.29%        | 50.18% |
| Aa            | 8.52%  | 52.40% | 3.50%  | 1.60%  | 1.17%  | 1.95%  | 2.21%        | 28.65% |
| A             | 1.71%  | 2.07%  | 52.71% | 1.56%  | 1.07%  | 0.66%  | 2.01%        | 38.20% |
| Baa           | 1.09%  | 1.09%  | 1.95%  | 50.39% | 8.03%  | 3.99%  | 10.93%       | 22.54% |
| Ba            | 1.31%  | 1.14%  | 1.14%  | 1.31%  | 35.29% | 4.08%  | 34.64%       | 21.08% |
| B             | 1.62%  | 0.00%  | 1.62%  | 2.16%  | 2.16%  | 38.92% | 26.49%       | 27.03% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 37.50%       | 62.50% |
| <b>5-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 35.45% | 0.83%  | 0.47%  | 0.34%  | 0.20%  | 0.11%  | 0.15%        | 62.44% |
| Aa            | 9.45%  | 42.90% | 3.17%  | 1.41%  | 0.85%  | 2.55%  | 1.87%        | 37.80% |
| A             | 2.15%  | 1.79%  | 42.59% | 1.12%  | 0.75%  | 0.39%  | 1.65%        | 49.57% |
| Baa           | 1.36%  | 1.48%  | 1.67%  | 41.15% | 7.77%  | 3.82%  | 14.31%       | 28.44% |
| Ba            | 1.97%  | 1.48%  | 1.23%  | 1.48%  | 31.03% | 3.20%  | 30.30%       | 29.31% |
| B             | 3.25%  | 0.00%  | 1.63%  | 3.25%  | 2.44%  | 33.33% | 19.51%       | 36.59% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 30.77%       | 69.23% |



**Figure 63 - US HEL Rating Transition Matrices (Weighted Averages, 1990-2004)**

| <b>1-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa or below</b> | <b>WR</b> |
|---------------|------------|-----------|----------|------------|-----------|----------|---------------------|-----------|
| Aaa           | 94.56%     | 0.11%     | 0.00%    | 0.00%      | 0.00%     | 0.00%    | 0.00%               | 5.33%     |
| Aa            | 2.11%      | 93.67%    | 0.43%    | 0.00%      | 0.04%     | 0.00%    | 0.00%               | 3.75%     |
| A             | 0.43%      | 1.65%     | 93.52%   | 1.26%      | 0.35%     | 0.04%    | 0.04%               | 2.71%     |
| Baa           | 0.07%      | 0.18%     | 0.91%    | 92.41%     | 2.07%     | 0.76%    | 0.84%               | 2.76%     |
| Ba            | 0.00%      | 0.18%     | 0.53%    | 3.35%      | 84.51%    | 2.11%    | 5.99%               | 3.35%     |
| B             | 0.00%      | 0.00%     | 0.44%    | 0.88%      | 1.33%     | 85.84%   | 8.41%               | 3.10%     |
| Caa or below  | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 0.00%    | 82.35%              | 17.65%    |
| <b>2-year</b> |            |           |          |            |           |          |                     |           |
| Aaa           | 86.07%     | 0.29%     | 0.00%    | 0.00%      | 0.00%     | 0.00%    | 0.00%               | 13.64%    |
| Aa            | 4.48%      | 84.65%    | 1.15%    | 0.13%      | 0.06%     | 0.00%    | 0.00%               | 9.53%     |
| A             | 1.08%      | 3.67%     | 84.40%   | 2.83%      | 0.84%     | 0.18%    | 0.18%               | 6.81%     |
| Baa           | 0.24%      | 0.43%     | 2.14%    | 82.22%     | 4.58%     | 1.95%    | 2.26%               | 6.17%     |
| Ba            | 0.22%      | 0.45%     | 1.12%    | 1.12%      | 73.83%    | 3.36%    | 13.20%              | 6.71%     |
| B             | 0.53%      | 0.00%     | 1.06%    | 1.59%      | 2.12%     | 72.49%   | 12.70%              | 9.52%     |
| Caa or below  | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 0.00%    | 55.81%              | 44.19%    |
| <b>3-year</b> |            |           |          |            |           |          |                     |           |
| Aaa           | 76.43%     | 0.25%     | 0.00%    | 0.00%      | 0.00%     | 0.00%    | 0.00%               | 23.32%    |
| Aa            | 6.97%      | 75.10%    | 1.62%    | 0.19%      | 0.10%     | 0.00%    | 0.00%               | 16.03%    |
| A             | 1.95%      | 5.42%     | 74.33%   | 4.09%      | 1.33%     | 0.44%    | 0.44%               | 11.99%    |
| Baa           | 0.49%      | 0.88%     | 3.53%    | 71.69%     | 6.86%     | 3.62%    | 4.60%               | 8.33%     |
| Ba            | 0.60%      | 0.89%     | 1.79%    | 1.49%      | 63.10%    | 3.87%    | 17.26%              | 11.01%    |
| B             | 1.31%      | 0.00%     | 1.96%    | 2.61%      | 2.61%     | 60.78%   | 15.03%              | 15.69%    |
| Caa or below  | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 0.00%    | 37.04%              | 62.96%    |
| <b>4-year</b> |            |           |          |            |           |          |                     |           |
| Aaa           | 67.61%     | 0.18%     | 0.00%    | 0.00%      | 0.00%     | 0.00%    | 0.00%               | 32.22%    |
| Aa            | 8.59%      | 65.63%    | 1.69%    | 0.28%      | 0.14%     | 0.00%    | 0.00%               | 23.66%    |
| A             | 2.72%      | 6.87%     | 64.51%   | 4.15%      | 2.07%     | 0.78%    | 0.78%               | 18.13%    |
| Baa           | 0.74%      | 1.19%     | 4.46%    | 61.66%     | 8.92%     | 4.61%    | 7.28%               | 11.14%    |
| Ba            | 1.29%      | 1.29%     | 2.59%    | 1.72%      | 52.16%    | 4.31%    | 18.97%              | 17.67%    |
| B             | 2.54%      | 0.00%     | 2.54%    | 3.39%      | 3.39%     | 50.00%   | 14.41%              | 23.73%    |
| Caa or below  | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 0.00%    | 33.33%              | 66.67%    |
| <b>5-year</b> |            |           |          |            |           |          |                     |           |
| Aaa           | 59.07%     | 0.12%     | 0.00%    | 0.00%      | 0.00%     | 0.00%    | 0.00%               | 40.80%    |
| Aa            | 9.77%      | 54.35%    | 1.91%    | 0.42%      | 0.21%     | 0.00%    | 0.00%               | 33.33%    |
| A             | 3.58%      | 6.98%     | 54.15%   | 3.77%      | 2.08%     | 1.13%    | 1.51%               | 26.79%    |
| Baa           | 0.90%      | 1.81%     | 4.74%    | 49.89%     | 10.84%    | 5.19%    | 9.93%               | 16.70%    |
| Ba            | 2.61%      | 1.31%     | 3.27%    | 1.31%      | 47.06%    | 4.58%    | 16.99%              | 22.88%    |
| B             | 4.76%      | 0.00%     | 2.38%    | 4.76%      | 3.57%     | 40.48%   | 14.29%              | 29.76%    |
| Caa or below  | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 0.00%    | 16.67%              | 83.33%    |

**Figure 64 - US ABS (excl. MH and HEL) Rating Transition Matrices (Weighted Averages, 1983-2004)**

| 1-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
|---------------|--------|--------|--------|--------|--------|--------|--------------|--------|
| Aaa           | 86.68% | 0.65%  | 0.11%  | 0.09%  | 0.02%  | 0.01%  | 0.10%        | 12.33% |
| Aa            | 1.76%  | 80.96% | 3.24%  | 1.82%  | 0.68%  | 0.20%  | 0.74%        | 10.60% |
| A             | 0.66%  | 0.95%  | 86.55% | 1.78%  | 0.67%  | 0.19%  | 0.12%        | 9.08%  |
| Baa           | 1.20%  | 0.74%  | 1.08%  | 79.59% | 4.33%  | 2.11%  | 1.71%        | 9.24%  |
| Ba            | 1.17%  | 0.00%  | 0.20%  | 0.78%  | 70.45% | 7.83%  | 12.92%       | 6.65%  |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.65%  | 0.00%  | 56.13% | 41.29%       | 1.94%  |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.39%  | 82.75%       | 16.86% |
| <b>2-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 72.27% | 0.94%  | 0.21%  | 0.17%  | 0.10%  | 0.05%  | 0.23%        | 26.04% |
| Aa            | 2.06%  | 62.90% | 3.88%  | 3.56%  | 1.90%  | 0.32%  | 1.90%        | 23.50% |
| A             | 1.22%  | 1.25%  | 73.55% | 2.07%  | 0.98%  | 0.62%  | 0.85%        | 19.46% |
| Baa           | 2.48%  | 1.02%  | 1.53%  | 63.26% | 3.21%  | 2.99%  | 4.89%        | 20.60% |
| Ba            | 1.89%  | 0.00%  | 0.54%  | 1.08%  | 53.37% | 5.93%  | 20.75%       | 16.44% |
| B             | 0.00%  | 0.00%  | 0.00%  | 1.00%  | 0.00%  | 39.00% | 49.00%       | 11.00% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.74%  | 58.09%       | 41.18% |
| <b>3-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 57.03% | 0.88%  | 0.25%  | 0.24%  | 0.18%  | 0.04%  | 0.25%        | 41.12% |
| Aa            | 1.99%  | 48.62% | 3.51%  | 2.75%  | 2.09%  | 1.04%  | 2.37%        | 37.61% |
| A             | 0.98%  | 1.07%  | 62.07% | 1.48%  | 0.87%  | 0.65%  | 1.35%        | 31.53% |
| Baa           | 1.80%  | 0.57%  | 1.04%  | 50.33% | 2.56%  | 2.47%  | 7.03%        | 34.19% |
| Ba            | 2.30%  | 0.00%  | 0.77%  | 0.00%  | 36.02% | 5.75%  | 25.67%       | 29.50% |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 28.79% | 43.94%       | 27.27% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 30.00%       | 70.00% |
| <b>4-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 42.39% | 0.51%  | 0.23%  | 0.19%  | 0.21%  | 0.04%  | 0.23%        | 56.20% |
| Aa            | 1.75%  | 37.46% | 2.57%  | 1.28%  | 1.63%  | 1.40%  | 2.22%        | 51.69% |
| A             | 0.48%  | 0.99%  | 51.21% | 0.94%  | 0.67%  | 0.43%  | 1.51%        | 43.76% |
| Baa           | 0.64%  | 0.26%  | 0.77%  | 39.59% | 2.06%  | 1.54%  | 7.33%        | 47.81% |
| Ba            | 2.65%  | 0.00%  | 0.53%  | 0.00%  | 28.04% | 4.23%  | 18.52%       | 46.03% |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 27.91% | 20.93%       | 51.16% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 11.54%       | 88.46% |
| <b>5-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 30.12% | 0.36%  | 0.15%  | 0.06%  | 0.17%  | 0.02%  | 0.15%        | 68.96% |
| Aa            | 1.60%  | 30.03% | 1.90%  | 0.73%  | 0.44%  | 0.87%  | 1.60%        | 62.83% |
| A             | 0.38%  | 0.86%  | 41.27% | 0.62%  | 0.41%  | 0.17%  | 0.99%        | 55.30% |
| Baa           | 0.54%  | 0.18%  | 0.36%  | 30.85% | 2.00%  | 0.73%  | 5.44%        | 59.89% |
| Ba            | 3.10%  | 0.00%  | 0.00%  | 0.00%  | 18.60% | 3.10%  | 10.08%       | 65.12% |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 28.00% | 0.00%        | 72.00% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 15.38%       | 84.62% |

**Figure 65 - US CDO Rating Transition Matrices (Weighted Averages, 1991-2004)**

| 1-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
|---------------|--------|--------|--------|--------|--------|--------|--------------|--------|
| Aaa           | 91.37% | 2.88%  | 0.86%  | 0.52%  | 0.12%  | 0.00%  | 0.00%        | 4.26%  |
| Aa            | 0.56%  | 86.48% | 5.21%  | 2.61%  | 0.70%  | 0.35%  | 0.14%        | 3.94%  |
| A             | 0.00%  | 0.83%  | 87.14% | 4.15%  | 1.83%  | 0.58%  | 0.83%        | 4.65%  |
| Baa           | 0.00%  | 0.05%  | 0.30%  | 83.82% | 5.59%  | 3.61%  | 2.77%        | 3.86%  |
| Ba            | 0.00%  | 0.00%  | 0.00%  | 0.45%  | 80.85% | 5.40%  | 9.44%        | 3.87%  |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.73%  | 72.75% | 24.09%       | 2.43%  |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 94.93%       | 5.07%  |
| <b>2-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 80.49% | 6.07%  | 2.79%  | 1.23%  | 0.41%  | 0.25%  | 0.00%        | 8.77%  |
| Aa            | 0.85%  | 71.23% | 8.74%  | 6.36%  | 2.47%  | 1.14%  | 0.66%        | 8.55%  |
| A             | 0.12%  | 1.74%  | 71.46% | 6.45%  | 4.22%  | 1.99%  | 3.35%        | 10.67% |
| Baa           | 0.00%  | 0.20%  | 0.59%  | 65.28% | 9.19%  | 6.91%  | 9.58%        | 8.27%  |
| Ba            | 0.00%  | 0.00%  | 0.00%  | 1.23%  | 60.05% | 8.58%  | 22.43%       | 7.72%  |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.66%  | 51.64% | 41.45%       | 6.25%  |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 89.43%       | 10.57% |
| <b>3-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 65.58% | 9.39%  | 5.13%  | 2.50%  | 0.75%  | 0.75%  | 0.00%        | 15.89% |
| Aa            | 0.91%  | 55.15% | 10.30% | 11.21% | 5.22%  | 2.09%  | 2.09%        | 13.04% |
| A             | 0.20%  | 2.35%  | 53.53% | 5.69%  | 6.27%  | 3.73%  | 7.45%        | 20.78% |
| Baa           | 0.00%  | 0.18%  | 0.37%  | 47.30% | 9.06%  | 9.24%  | 19.95%       | 13.91% |
| Ba            | 0.00%  | 0.00%  | 0.00%  | 1.64%  | 42.44% | 7.29%  | 36.61%       | 12.02% |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 37.99% | 51.53%       | 10.48% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 88.89%       | 11.11% |
| <b>4-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 54.17% | 8.77%  | 6.14%  | 3.51%  | 0.66%  | 1.32%  | 0.00%        | 25.44% |
| Aa            | 0.95%  | 44.78% | 11.20% | 11.76% | 6.26%  | 2.28%  | 3.98%        | 18.79% |
| A             | 0.34%  | 2.68%  | 41.28% | 3.36%  | 5.03%  | 4.03%  | 10.07%       | 33.22% |
| Baa           | 0.00%  | 0.14%  | 0.14%  | 35.57% | 8.12%  | 9.10%  | 26.75%       | 20.17% |
| Ba            | 0.00%  | 0.00%  | 0.00%  | 2.21%  | 30.60% | 4.73%  | 42.59%       | 19.87% |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 30.57% | 57.32%       | 12.10% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 85.71%       | 14.29% |
| <b>5-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 44.95% | 5.96%  | 4.59%  | 4.13%  | 0.46%  | 0.92%  | 0.00%        | 38.99% |
| Aa            | 0.86%  | 36.78% | 12.64% | 11.21% | 6.32%  | 2.01%  | 4.89%        | 25.29% |
| A             | 0.00%  | 3.27%  | 31.37% | 1.31%  | 3.27%  | 5.23%  | 7.84%        | 47.71% |
| Baa           | 0.00%  | 0.23%  | 0.23%  | 25.69% | 8.56%  | 8.33%  | 29.63%       | 27.31% |
| Ba            | 0.00%  | 0.00%  | 0.00%  | 2.55%  | 22.93% | 5.10%  | 40.76%       | 28.66% |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 22.58% | 62.37%       | 15.05% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 80.00%       | 20.00% |

**Figure 66 - US CDO (excl. HY CBOs) Rating Transition Matrices (Weighted Averages, 1991-2004)**

| 1-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
|---------------|--------|--------|--------|--------|--------|--------|--------------|--------|
| Aaa           | 92.66% | 1.89%  | 0.53%  | 0.23%  | 0.08%  | 0.00%  | 0.00%        | 4.61%  |
| Aa            | 0.60%  | 89.09% | 3.97%  | 1.29%  | 0.30%  | 0.20%  | 0.10%        | 4.46%  |
| A             | 0.00%  | 0.81%  | 89.38% | 2.73%  | 1.21%  | 0.40%  | 0.51%        | 4.95%  |
| Baa           | 0.00%  | 0.07%  | 0.21%  | 87.33% | 3.51%  | 2.65%  | 1.72%        | 4.51%  |
| Ba            | 0.00%  | 0.00%  | 0.00%  | 0.68%  | 87.11% | 3.26%  | 4.21%        | 4.75%  |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 77.72% | 18.48%       | 3.80%  |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 83.93%       | 16.07% |
| <b>2-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 84.23% | 3.45%  | 1.61%  | 0.46%  | 0.23%  | 0.12%  | 0.00%        | 9.90%  |
| Aa            | 1.03%  | 77.91% | 6.77%  | 2.65%  | 0.88%  | 0.59%  | 0.15%        | 10.01% |
| A             | 0.16%  | 2.18%  | 75.82% | 4.21%  | 2.65%  | 1.25%  | 2.03%        | 11.70% |
| Baa           | 0.00%  | 0.20%  | 0.60%  | 72.71% | 6.65%  | 4.73%  | 5.14%        | 9.97%  |
| Ba            | 0.00%  | 0.00%  | 0.00%  | 1.98%  | 72.42% | 4.37%  | 10.71%       | 10.52% |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 68.99% | 21.71%       | 9.30%  |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 62.96%       | 37.04% |
| <b>3-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 71.73% | 5.50%  | 2.47%  | 0.76%  | 0.38%  | 0.19%  | 0.00%        | 18.98% |
| Aa            | 1.59%  | 65.83% | 8.88%  | 4.56%  | 1.59%  | 0.91%  | 0.23%        | 16.40% |
| A             | 0.26%  | 3.07%  | 59.59% | 3.84%  | 3.58%  | 2.05%  | 3.58%        | 24.04% |
| Baa           | 0.00%  | 0.15%  | 0.46%  | 58.12% | 7.74%  | 6.53%  | 9.10%        | 17.91% |
| Ba            | 0.00%  | 0.00%  | 0.00%  | 2.88%  | 58.15% | 4.15%  | 16.61%       | 18.21% |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 61.70% | 21.28%       | 17.02% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 61.54%       | 38.46% |
| <b>4-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 60.69% | 4.48%  | 2.41%  | 1.03%  | 0.34%  | 0.34%  | 0.00%        | 30.69% |
| Aa            | 1.86%  | 58.36% | 8.92%  | 3.35%  | 1.12%  | 0.37%  | 0.37%        | 25.65% |
| A             | 0.43%  | 3.43%  | 46.78% | 2.58%  | 2.15%  | 1.29%  | 4.72%        | 38.63% |
| Baa           | 0.00%  | 0.00%  | 0.00%  | 48.16% | 8.35%  | 6.39%  | 9.83%        | 27.27% |
| Ba            | 0.00%  | 0.00%  | 0.00%  | 3.85%  | 43.41% | 3.85%  | 18.13%       | 30.77% |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 59.65% | 19.30%       | 21.05% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 75.00%       | 25.00% |
| <b>5-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 51.15% | 2.29%  | 0.76%  | 0.76%  | 0.00%  | 0.00%  | 0.00%        | 45.04% |
| Aa            | 1.90%  | 50.00% | 10.13% | 3.16%  | 0.00%  | 0.00%  | 0.00%        | 34.81% |
| A             | 0.00%  | 4.07%  | 36.59% | 0.81%  | 0.81%  | 2.44%  | 0.81%        | 54.47% |
| Baa           | 0.00%  | 0.00%  | 0.00%  | 37.34% | 10.30% | 7.30%  | 9.01%        | 36.05% |
| Ba            | 0.00%  | 0.00%  | 0.00%  | 4.35%  | 30.43% | 5.43%  | 17.39%       | 42.39% |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 51.72% | 17.24%       | 31.03% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 50.00%       | 50.00% |

**Figure 67 - US CMBS Rating Transition Matrices (Weighted Averages, 1988-2004)**

| 1-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
|---------------|--------|--------|--------|--------|--------|--------|--------------|--------|
| Aaa           | 91.32% | 0.91%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        | 7.77%  |
| Aa            | 8.22%  | 82.75% | 0.97%  | 0.20%  | 0.00%  | 0.10%  | 0.05%        | 7.71%  |
| A             | 1.60%  | 4.50%  | 86.63% | 1.60%  | 0.05%  | 0.00%  | 0.00%        | 5.63%  |
| Baa           | 0.43%  | 0.87%  | 3.27%  | 84.23% | 2.53%  | 0.30%  | 0.10%        | 8.27%  |
| Ba            | 0.00%  | 0.06%  | 0.52%  | 2.13%  | 89.72% | 3.04%  | 0.32%        | 4.20%  |
| B             | 0.14%  | 0.00%  | 0.07%  | 0.43%  | 0.87%  | 89.81% | 6.29%        | 2.38%  |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 1.06%  | 89.36%       | 9.57%  |
| <b>2-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 84.03% | 1.29%  | 0.14%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        | 14.54% |
| Aa            | 13.37% | 67.44% | 1.55%  | 0.45%  | 0.26%  | 0.06%  | 0.13%        | 16.73% |
| A             | 2.54%  | 7.51%  | 74.75% | 2.23%  | 0.56%  | 0.00%  | 0.06%        | 12.34% |
| Baa           | 0.93%  | 1.60%  | 5.50%  | 69.96% | 3.68%  | 0.80%  | 0.18%        | 17.35% |
| Ba            | 0.00%  | 0.37%  | 0.83%  | 3.21%  | 81.08% | 4.68%  | 1.10%        | 8.72%  |
| B             | 0.00%  | 0.00%  | 0.10%  | 1.00%  | 1.40%  | 80.54% | 10.73%       | 6.22%  |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 2.46%  | 85.25%       | 12.30% |
| <b>3-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 77.68% | 1.31%  | 0.31%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        | 20.70% |
| Aa            | 16.37% | 53.82% | 1.68%  | 0.76%  | 0.67%  | 0.08%  | 0.34%        | 26.28% |
| A             | 3.49%  | 9.35%  | 63.44% | 2.47%  | 1.11%  | 0.00%  | 0.00%        | 20.15% |
| Baa           | 1.40%  | 2.23%  | 7.84%  | 61.73% | 3.25%  | 1.02%  | 0.32%        | 22.19% |
| Ba            | 0.00%  | 1.10%  | 0.41%  | 4.14%  | 70.07% | 6.62%  | 2.07%        | 15.59% |
| B             | 0.00%  | 0.00%  | 0.15%  | 1.17%  | 1.76%  | 69.16% | 15.71%       | 12.04% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 3.80%  | 81.01%       | 15.19% |
| <b>4-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 71.90% | 1.44%  | 0.63%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        | 26.03% |
| Aa            | 20.33% | 40.66% | 0.98%  | 0.77%  | 1.31%  | 0.00%  | 0.44%        | 35.52% |
| A             | 4.75%  | 11.94% | 52.98% | 2.19%  | 0.85%  | 0.00%  | 0.00%        | 27.28% |
| Baa           | 2.61%  | 3.00%  | 9.78%  | 53.82% | 2.81%  | 0.68%  | 0.39%        | 26.91% |
| Ba            | 0.00%  | 1.66%  | 0.21%  | 5.60%  | 56.22% | 7.26%  | 2.90%        | 26.14% |
| B             | 0.00%  | 0.00%  | 0.22%  | 1.77%  | 2.65%  | 56.86% | 18.81%       | 19.69% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 5.36%  | 75.00%       | 19.64% |
| <b>5-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 64.85% | 1.59%  | 0.93%  | 0.13%  | 0.00%  | 0.00%  | 0.00%        | 32.49% |
| Aa            | 24.10% | 27.55% | 0.86%  | 0.57%  | 1.72%  | 0.00%  | 0.57%        | 44.62% |
| A             | 7.07%  | 14.66% | 40.64% | 1.77%  | 0.53%  | 0.00%  | 0.00%        | 35.34% |
| Baa           | 4.34%  | 4.05%  | 12.72% | 43.64% | 1.73%  | 0.58%  | 0.58%        | 32.37% |
| Ba            | 0.00%  | 3.14%  | 0.31%  | 5.97%  | 42.14% | 6.29%  | 3.14%        | 38.99% |
| B             | 0.00%  | 0.00%  | 0.34%  | 2.41%  | 3.79%  | 45.86% | 17.59%       | 30.00% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 7.89%  | 60.53%       | 31.58% |

**Figure 68 - US RMBS Rating Transition Matrices (Weighted Averages, 1983-2004)**

| <b>1-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa or below</b> | <b>WR</b> |
|---------------|------------|-----------|----------|------------|-----------|----------|---------------------|-----------|
| Aaa           | 90.21%     | 0.33%     | 0.08%    | 0.01%      | 0.00%     | 0.00%    | 0.01%               | 9.36%     |
| Aa            | 7.76%      | 84.15%    | 1.66%    | 0.32%      | 0.02%     | 0.04%    | 0.01%               | 6.04%     |
| A             | 2.07%      | 6.00%     | 83.40%   | 1.71%      | 0.16%     | 0.02%    | 0.20%               | 6.44%     |
| Baa           | 0.57%      | 0.98%     | 4.94%    | 85.06%     | 1.57%     | 0.70%    | 0.74%               | 5.46%     |
| Ba            | 0.14%      | 0.14%     | 1.64%    | 5.60%      | 83.26%    | 1.35%    | 2.41%               | 5.45%     |
| B             | 0.00%      | 0.00%     | 0.08%    | 0.67%      | 4.24%     | 83.69%   | 4.91%               | 6.41%     |
| Caa or below  | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.14%     | 0.00%    | 90.01%              | 9.84%     |
| <b>2-year</b> |            |           |          |            |           |          |                     |           |
| Aaa           | 79.70%     | 0.60%     | 0.16%    | 0.04%      | 0.00%     | 0.00%    | 0.08%               | 19.41%    |
| Aa            | 13.77%     | 69.34%    | 2.91%    | 0.86%      | 0.10%     | 0.04%    | 0.09%               | 12.89%    |
| A             | 5.05%      | 8.56%     | 68.44%   | 2.32%      | 0.83%     | 0.21%    | 0.39%               | 14.20%    |
| Baa           | 1.21%      | 2.22%     | 7.08%    | 71.93%     | 1.84%     | 1.46%    | 2.24%               | 12.02%    |
| Ba            | 0.34%      | 0.17%     | 3.66%    | 8.84%      | 68.43%    | 1.46%    | 4.73%               | 12.38%    |
| B             | 0.00%      | 0.00%     | 0.00%    | 1.39%      | 4.97%     | 69.98%   | 7.36%               | 16.30%    |
| Caa or below  | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.33%     | 0.00%    | 81.97%              | 17.70%    |
| <b>3-year</b> |            |           |          |            |           |          |                     |           |
| Aaa           | 71.32%     | 0.79%     | 0.24%    | 0.08%      | 0.01%     | 0.00%    | 0.17%               | 27.39%    |
| Aa            | 18.62%     | 56.42%    | 3.57%    | 1.31%      | 0.36%     | 0.12%    | 0.19%               | 19.40%    |
| A             | 7.58%      | 10.13%    | 56.95%   | 2.52%      | 0.74%     | 0.58%    | 0.92%               | 20.57%    |
| Baa           | 1.91%      | 2.53%     | 8.51%    | 63.20%     | 1.70%     | 1.64%    | 4.38%               | 16.14%    |
| Ba            | 0.60%      | 0.27%     | 4.53%    | 9.93%      | 60.27%    | 1.40%    | 5.67%               | 17.33%    |
| B             | 0.00%      | 0.00%     | 0.00%    | 2.18%      | 1.70%     | 63.76%   | 9.21%               | 23.15%    |
| Caa or below  | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.58%     | 0.00%    | 74.46%              | 24.95%    |
| <b>4-year</b> |            |           |          |            |           |          |                     |           |
| Aaa           | 64.51%     | 0.92%     | 0.26%    | 0.07%      | 0.03%     | 0.01%    | 0.27%               | 33.94%    |
| Aa            | 22.68%     | 45.10%    | 3.91%    | 1.52%      | 0.40%     | 0.27%    | 0.45%               | 25.68%    |
| A             | 10.04%     | 11.52%    | 46.95%   | 2.60%      | 0.77%     | 0.67%    | 1.26%               | 26.19%    |
| Baa           | 2.91%      | 3.16%     | 9.60%    | 55.32%     | 1.44%     | 1.61%    | 5.86%               | 20.10%    |
| Ba            | 0.85%      | 0.46%     | 5.92%    | 11.46%     | 52.54%    | 1.54%    | 6.38%               | 20.85%    |
| B             | 0.00%      | 0.00%     | 0.00%    | 2.98%      | 1.28%     | 56.82%   | 11.08%              | 27.84%    |
| Caa or below  | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.96%     | 0.00%    | 68.43%              | 30.60%    |
| <b>5-year</b> |            |           |          |            |           |          |                     |           |
| Aaa           | 57.53%     | 0.92%     | 0.30%    | 0.10%      | 0.01%     | 0.03%    | 0.28%               | 40.83%    |
| Aa            | 25.29%     | 35.79%    | 3.47%    | 1.58%      | 0.35%     | 0.31%    | 0.79%               | 32.42%    |
| A             | 11.92%     | 11.72%    | 37.84%   | 2.55%      | 0.80%     | 0.60%    | 1.63%               | 32.93%    |
| Baa           | 3.84%      | 3.61%     | 10.86%   | 47.24%     | 1.18%     | 1.72%    | 6.98%               | 24.58%    |
| Ba            | 1.06%      | 0.80%     | 7.19%    | 13.22%     | 43.39%    | 1.42%    | 7.36%               | 25.55%    |
| B             | 0.00%      | 0.00%     | 0.00%    | 3.83%      | 1.17%     | 48.67%   | 12.67%              | 33.67%    |
| Caa or below  | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 1.31%     | 0.00%    | 63.07%              | 35.62%    |

**Figure 69 - One-Year Rating Transition Matrices by Sector (Weighted Average, 1998-2004)**

| Global Structured Finance    | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
|------------------------------|--------|--------|--------|--------|--------|--------|--------------|--------|
| Aaa                          | 88.96% | 0.60%  | 0.22%  | 0.09%  | 0.04%  | 0.02%  | 0.04%        | 10.02% |
| Aa                           | 4.50%  | 84.41% | 1.93%  | 0.88%  | 0.28%  | 0.16%  | 0.23%        | 7.62%  |
| A                            | 1.08%  | 2.51%  | 85.99% | 2.01%  | 0.71%  | 0.28%  | 0.29%        | 7.12%  |
| Baa                          | 0.43%  | 0.64%  | 2.36%  | 84.54% | 3.03%  | 1.38%  | 1.35%        | 6.26%  |
| Ba                           | 0.10%  | 0.12%  | 0.72%  | 3.20%  | 80.96% | 3.67%  | 6.22%        | 5.01%  |
| B                            | 0.06%  | 0.00%  | 0.10%  | 0.48%  | 2.16%  | 81.38% | 11.82%       | 4.00%  |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.38%  | 91.23%       | 8.40%  |
| <b>US ABS</b>                |        |        |        |        |        |        |              |        |
| Aaa                          | 88.72% | 0.67%  | 0.41%  | 0.17%  | 0.10%  | 0.07%  | 0.11%        | 9.75%  |
| Aa                           | 1.81%  | 88.69% | 2.47%  | 1.39%  | 0.58%  | 0.35%  | 0.65%        | 4.06%  |
| A                            | 0.61%  | 1.04%  | 87.01% | 2.18%  | 0.96%  | 0.48%  | 0.39%        | 7.34%  |
| Baa                          | 0.47%  | 0.41%  | 0.82%  | 85.29% | 3.88%  | 2.02%  | 2.27%        | 4.84%  |
| Ba                           | 0.30%  | 0.23%  | 0.15%  | 4.41%  | 69.58% | 5.48%  | 16.20%       | 3.65%  |
| B                            | 0.00%  | 0.00%  | 0.21%  | 0.64%  | 0.64%  | 64.59% | 31.76%       | 2.15%  |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.18%  | 89.12%       | 10.70% |
| <b>US HEL</b>                |        |        |        |        |        |        |              |        |
| Aaa                          | 94.67% | 0.09%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        | 5.24%  |
| Aa                           | 2.13%  | 93.78% | 0.46%  | 0.00%  | 0.05%  | 0.00%  | 0.00%        | 3.57%  |
| A                            | 0.43%  | 1.46%  | 93.76% | 1.38%  | 0.26%  | 0.04%  | 0.04%        | 2.62%  |
| Baa                          | 0.08%  | 0.19%  | 0.84%  | 92.65% | 1.71%  | 0.80%  | 0.84%        | 2.89%  |
| Ba                           | 0.00%  | 0.19%  | 0.38%  | 3.63%  | 83.40% | 2.29%  | 6.49%        | 3.63%  |
| B                            | 0.00%  | 0.00%  | 0.50%  | 1.01%  | 1.51%  | 83.92% | 9.55%        | 3.52%  |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 83.33%       | 16.67% |
| <b>US ABS excl. MH, HEL</b>  |        |        |        |        |        |        |              |        |
| Aaa                          | 86.20% | 0.51%  | 0.17%  | 0.14%  | 0.03%  | 0.02%  | 0.15%        | 12.77% |
| Aa                           | 2.03%  | 80.83% | 4.26%  | 2.61%  | 0.97%  | 0.29%  | 1.06%        | 7.94%  |
| A                            | 0.71%  | 0.88%  | 84.97% | 2.27%  | 0.77%  | 0.21%  | 0.15%        | 10.05% |
| Baa                          | 1.32%  | 0.73%  | 1.12%  | 77.65% | 4.76%  | 2.45%  | 1.98%        | 9.99%  |
| Ba                           | 0.88%  | 0.00%  | 0.00%  | 0.88%  | 69.09% | 8.39%  | 14.35%       | 6.40%  |
| B                            | 0.00%  | 0.00%  | 0.00%  | 0.68%  | 0.00%  | 54.42% | 43.54%       | 1.36%  |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.39%  | 82.75%       | 16.86% |
| <b>US CDOs</b>               |        |        |        |        |        |        |              |        |
| Aaa                          | 91.35% | 2.92%  | 0.88%  | 0.53%  | 0.12%  | 0.00%  | 0.00%        | 4.21%  |
| Aa                           | 0.62%  | 85.71% | 5.43%  | 2.87%  | 0.78%  | 0.39%  | 0.16%        | 4.04%  |
| A                            | 0.00%  | 0.85%  | 87.02% | 4.16%  | 1.87%  | 0.59%  | 0.85%        | 4.66%  |
| Baa                          | 0.00%  | 0.05%  | 0.32%  | 83.35% | 5.62%  | 3.83%  | 2.94%        | 3.89%  |
| Ba                           | 0.00%  | 0.00%  | 0.00%  | 0.46%  | 80.69% | 5.46%  | 9.56%        | 3.83%  |
| B                            | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.76%  | 72.15% | 24.81%       | 2.28%  |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 94.93%       | 5.07%  |
| <b>US CDOs excl. HY CBOs</b> |        |        |        |        |        |        |              |        |
| Aaa                          | 92.69% | 1.90%  | 0.53%  | 0.23%  | 0.08%  | 0.00%  | 0.00%        | 4.57%  |
| Aa                           | 0.63%  | 89.03% | 3.76%  | 1.36%  | 0.31%  | 0.21%  | 0.10%        | 4.60%  |
| A                            | 0.00%  | 0.83%  | 89.35% | 2.69%  | 1.24%  | 0.41%  | 0.52%        | 4.96%  |
| Baa                          | 0.00%  | 0.07%  | 0.22%  | 87.26% | 3.35%  | 2.76%  | 1.79%        | 4.55%  |
| Ba                           | 0.00%  | 0.00%  | 0.00%  | 0.68%  | 87.12% | 3.29%  | 4.25%        | 4.66%  |
| B                            | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 78.02% | 18.68%       | 3.30%  |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 83.93%       | 16.07% |
| <b>US CMBS</b>               |        |        |        |        |        |        |              |        |
| Aaa                          | 91.28% | 0.81%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        | 7.91%  |
| Aa                           | 9.36%  | 82.24% | 0.83%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        | 7.57%  |
| A                            | 1.76%  | 4.63%  | 86.16% | 1.54%  | 0.05%  | 0.00%  | 0.00%        | 5.86%  |
| Baa                          | 0.44%  | 0.91%  | 3.18%  | 83.92% | 2.60%  | 0.33%  | 0.00%        | 8.63%  |
| Ba                           | 0.00%  | 0.07%  | 0.56%  | 2.04%  | 89.59% | 3.23%  | 0.35%        | 4.15%  |
| B                            | 0.16%  | 0.00%  | 0.08%  | 0.39%  | 0.86%  | 89.68% | 6.72%        | 2.11%  |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.57%  | 91.38%       | 8.05%  |
| <b>US RMBS</b>               |        |        |        |        |        |        |              |        |
| Aaa                          | 88.23% | 0.10%  | 0.02%  | 0.00%  | 0.00%  | 0.00%  | 0.02%        | 11.62% |
| Aa                           | 7.50%  | 80.57% | 0.30%  | 0.13%  | 0.00%  | 0.00%  | 0.03%        | 11.47% |
| A                            | 2.64%  | 5.90%  | 81.57% | 0.44%  | 0.04%  | 0.04%  | 0.26%        | 9.12%  |
| Baa                          | 0.84%  | 1.40%  | 5.57%  | 83.07% | 0.18%  | 0.18%  | 0.53%        | 8.24%  |
| Ba                           | 0.15%  | 0.23%  | 2.26%  | 6.10%  | 81.84% | 0.00%  | 1.58%        | 7.84%  |
| B                            | 0.00%  | 0.00%  | 0.12%  | 0.84%  | 5.78%  | 82.67% | 2.53%        | 8.06%  |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 90.51%       | 9.49%  |

**Figure 70 - Two-Year Rating Transition Matrices by Sector (Weighted Average, 1998-2004)**

| Global Structured Finance    |        |        |        |        |        |        |              |        |
|------------------------------|--------|--------|--------|--------|--------|--------|--------------|--------|
|                              | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
| Aaa                          | 76.07% | 1.00%  | 0.41%  | 0.24%  | 0.13%  | 0.09%  | 0.11%        | 21.95% |
| Aa                           | 7.13%  | 68.92% | 2.87%  | 1.85%  | 0.82%  | 0.45%  | 0.76%        | 17.21% |
| A                            | 2.19%  | 3.60%  | 71.97% | 2.85%  | 1.27%  | 0.68%  | 1.14%        | 16.30% |
| Baa                          | 0.95%  | 1.33%  | 3.59%  | 68.83% | 4.33%  | 2.70%  | 3.96%        | 14.31% |
| Ba                           | 0.19%  | 0.26%  | 1.54%  | 3.31%  | 65.98% | 4.89%  | 12.78%       | 11.06% |
| B                            | 0.04%  | 0.00%  | 0.09%  | 0.99%  | 2.96%  | 67.59% | 17.59%       | 10.73% |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.45%  | 81.40%       | 18.16% |
| <b>US ABS</b>                |        |        |        |        |        |        |              |        |
| Aaa                          | 75.21% | 1.11%  | 0.68%  | 0.47%  | 0.32%  | 0.24%  | 0.31%        | 21.65% |
| Aa                           | 3.42%  | 75.78% | 3.60%  | 2.79%  | 1.50%  | 0.98%  | 2.13%        | 9.81%  |
| A                            | 1.18%  | 1.56%  | 73.41% | 2.89%  | 1.38%  | 1.06%  | 1.67%        | 16.86% |
| Baa                          | 1.18%  | 0.79%  | 1.55%  | 69.90% | 5.16%  | 3.79%  | 6.31%        | 11.32% |
| Ba                           | 0.40%  | 0.50%  | 0.30%  | 0.90%  | 56.02% | 4.88%  | 29.25%       | 7.76%  |
| B                            | 0.31%  | 0.00%  | 0.63%  | 1.25%  | 1.25%  | 51.10% | 36.99%       | 8.46%  |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.38%  | 69.70%       | 29.92% |
| <b>US HEL</b>                |        |        |        |        |        |        |              |        |
| Aaa                          | 86.50% | 0.25%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        | 13.25% |
| Aa                           | 4.65%  | 84.76% | 1.29%  | 0.14%  | 0.07%  | 0.00%  | 0.00%        | 9.08%  |
| A                            | 1.11%  | 3.40%  | 84.93% | 2.99%  | 0.63%  | 0.21%  | 0.21%        | 6.53%  |
| Baa                          | 0.26%  | 0.46%  | 2.18%  | 82.13% | 3.97%  | 2.12%  | 2.32%        | 6.55%  |
| Ba                           | 0.25%  | 0.50%  | 0.74%  | 1.24%  | 71.96% | 3.72%  | 14.14%       | 7.44%  |
| B                            | 0.62%  | 0.00%  | 1.23%  | 1.85%  | 2.47%  | 69.14% | 13.58%       | 11.11% |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 57.14%       | 42.86% |
| <b>US ABS excl. MH, HEL</b>  |        |        |        |        |        |        |              |        |
| Aaa                          | 71.20% | 0.68%  | 0.34%  | 0.27%  | 0.17%  | 0.08%  | 0.38%        | 26.88% |
| Aa                           | 2.82%  | 61.64% | 5.15%  | 5.51%  | 2.94%  | 0.49%  | 2.94%        | 18.50% |
| A                            | 1.26%  | 0.92%  | 70.42% | 2.72%  | 1.26%  | 0.82%  | 1.00%        | 21.61% |
| Baa                          | 2.93%  | 0.98%  | 1.42%  | 59.36% | 3.46%  | 3.64%  | 5.86%        | 22.36% |
| Ba                           | 0.96%  | 0.00%  | 0.00%  | 1.28%  | 52.40% | 6.39%  | 23.64%       | 15.34% |
| B                            | 0.00%  | 0.00%  | 0.00%  | 1.09%  | 0.00%  | 36.96% | 52.17%       | 9.78%  |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.74%  | 58.09%       | 41.18% |
| <b>US CDOs</b>               |        |        |        |        |        |        |              |        |
| Aaa                          | 80.47% | 6.20%  | 2.85%  | 1.26%  | 0.42%  | 0.25%  | 0.00%        | 8.55%  |
| Aa                           | 0.98%  | 68.73% | 9.34%  | 7.27%  | 2.82%  | 1.30%  | 0.76%        | 8.79%  |
| A                            | 0.13%  | 1.79%  | 71.15% | 6.54%  | 4.36%  | 2.05%  | 3.46%        | 10.51% |
| Baa                          | 0.00%  | 0.21%  | 0.63%  | 64.03% | 9.03%  | 7.48%  | 10.37%       | 8.25%  |
| Ba                           | 0.00%  | 0.00%  | 0.00%  | 1.25%  | 59.73% | 8.73%  | 22.69%       | 7.61%  |
| B                            | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.69%  | 50.00% | 43.06%       | 6.25%  |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 89.43%       | 10.57% |
| <b>US CDOs excl. HY CBOs</b> |        |        |        |        |        |        |              |        |
| Aaa                          | 84.30% | 3.49%  | 1.63%  | 0.47%  | 0.23%  | 0.12%  | 0.00%        | 9.77%  |
| Aa                           | 1.11%  | 77.23% | 6.53%  | 2.87%  | 0.96%  | 0.64%  | 0.16%        | 10.51% |
| A                            | 0.16%  | 2.26%  | 75.77% | 4.20%  | 2.75%  | 1.29%  | 2.10%        | 11.47% |
| Baa                          | 0.00%  | 0.21%  | 0.64%  | 72.07% | 6.50%  | 5.01%  | 5.44%        | 10.13% |
| Ba                           | 0.00%  | 0.00%  | 0.00%  | 2.01%  | 72.43% | 4.43%  | 10.66%       | 10.46% |
| B                            | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 69.29% | 22.05%       | 8.66%  |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 62.96%       | 37.04% |
| <b>US CMBS</b>               |        |        |        |        |        |        |              |        |
| Aaa                          | 84.17% | 1.11%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        | 14.72% |
| Aa                           | 15.43% | 66.81% | 1.64%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        | 16.12% |
| A                            | 2.72%  | 7.80%  | 73.80% | 2.28%  | 0.59%  | 0.00%  | 0.00%        | 12.80% |
| Baa                          | 0.80%  | 1.51%  | 5.33%  | 69.40% | 3.92%  | 0.90%  | 0.15%        | 17.99% |
| Ba                           | 0.00%  | 0.31%  | 0.83%  | 2.49%  | 81.95% | 5.19%  | 1.24%        | 7.99%  |
| B                            | 0.00%  | 0.00%  | 0.00%  | 0.78%  | 1.23%  | 80.38% | 11.88%       | 5.72%  |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.57%  | 91.38%       | 8.05%  |
| <b>US RMBS</b>               |        |        |        |        |        |        |              |        |
| Aaa                          | 74.09% | 0.12%  | 0.01%  | 0.00%  | 0.00%  | 0.00%  | 0.03%        | 25.74% |
| Aa                           | 10.62% | 63.56% | 0.38%  | 0.16%  | 0.00%  | 0.00%  | 0.06%        | 25.22% |
| A                            | 5.84%  | 6.27%  | 65.59% | 0.63%  | 0.05%  | 0.05%  | 0.34%        | 21.24% |
| Baa                          | 1.80%  | 3.11%  | 6.39%  | 67.60% | 0.32%  | 0.36%  | 0.68%        | 19.76% |
| Ba                           | 0.39%  | 0.29%  | 4.85%  | 7.76%  | 65.08% | 0.00%  | 2.52%        | 19.11% |
| B                            | 0.00%  | 0.00%  | 0.00%  | 1.73%  | 7.09%  | 65.83% | 4.41%        | 20.94% |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 82.18%       | 17.82% |



**Figure 71 - Three-Year Rating Transition Matrices by Sector (Weighted Average, 1998-2004)**

| <b>Global Structured Finance</b> |        |        |        |        |        |        |              |        |
|----------------------------------|--------|--------|--------|--------|--------|--------|--------------|--------|
|                                  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
| Aaa                              | 63.96% | 1.13%  | 0.55%  | 0.38%  | 0.18%  | 0.14%  | 0.19%        | 33.48% |
| Aa                               | 7.87%  | 56.00% | 2.98%  | 2.44%  | 1.28%  | 0.99%  | 1.32%        | 27.12% |
| A                                | 2.47%  | 3.79%  | 60.23% | 2.62%  | 1.48%  | 0.83%  | 1.87%        | 26.72% |
| Baa                              | 1.12%  | 1.45%  | 3.84%  | 56.93% | 3.99%  | 3.54%  | 7.76%        | 21.37% |
| Ba                               | 0.21%  | 0.39%  | 1.58%  | 3.23%  | 53.94% | 4.85%  | 17.90%       | 17.90% |
| B                                | 0.13%  | 0.00%  | 0.13%  | 1.20%  | 1.40%  | 57.08% | 21.73%       | 18.34% |
| Caa or below                     | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.32%  | 72.13%       | 27.55% |
| <b>US ABS</b>                    |        |        |        |        |        |        |              |        |
| Aaa                              | 62.34% | 1.23%  | 0.72%  | 0.70%  | 0.40%  | 0.31%  | 0.52%        | 33.78% |
| Aa                               | 4.67%  | 64.46% | 4.32%  | 2.81%  | 1.76%  | 2.31%  | 3.41%        | 16.27% |
| A                                | 1.14%  | 1.78%  | 61.92% | 2.70%  | 1.51%  | 1.06%  | 2.43%        | 27.47% |
| Baa                              | 1.07%  | 0.98%  | 1.79%  | 57.14% | 4.47%  | 4.70%  | 11.86%       | 17.99% |
| Ba                               | 0.28%  | 0.69%  | 0.55%  | 0.69%  | 44.95% | 5.26%  | 34.85%       | 12.72% |
| B                                | 0.92%  | 0.00%  | 0.92%  | 1.83%  | 1.83%  | 42.66% | 34.40%       | 17.43% |
| Caa or below                     | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 48.11%       | 51.89% |
| <b>US HEL</b>                    |        |        |        |        |        |        |              |        |
| Aaa                              | 78.09% | 0.16%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        | 21.74% |
| Aa                               | 7.60%  | 74.94% | 1.81%  | 0.23%  | 0.11%  | 0.00%  | 0.00%        | 15.31% |
| A                                | 1.99%  | 5.41%  | 74.83% | 4.42%  | 1.10%  | 0.55%  | 0.44%        | 11.26% |
| Baa                              | 0.45%  | 1.01%  | 3.80%  | 71.96% | 5.03%  | 4.02%  | 5.03%        | 8.72%  |
| Ba                               | 0.68%  | 0.68%  | 1.37%  | 1.71%  | 59.93% | 4.45%  | 18.84%       | 12.33% |
| B                                | 1.59%  | 0.00%  | 1.59%  | 3.17%  | 3.17%  | 55.56% | 16.67%       | 18.25% |
| Caa or below                     | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 38.46%       | 61.54% |
| <b>US ABS excl. MH, HEL</b>      |        |        |        |        |        |        |              |        |
| Aaa                              | 57.11% | 0.68%  | 0.46%  | 0.44%  | 0.33%  | 0.08%  | 0.46%        | 40.43% |
| Aa                               | 2.64%  | 47.27% | 5.12%  | 4.79%  | 3.64%  | 1.82%  | 4.13%        | 30.58% |
| A                                | 0.91%  | 0.71%  | 58.76% | 2.01%  | 1.31%  | 0.97%  | 1.61%        | 33.71% |
| Baa                              | 2.22%  | 0.49%  | 0.49%  | 45.87% | 2.84%  | 3.08%  | 8.75%        | 36.25% |
| Ba                               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 34.98% | 7.39%  | 30.54%       | 27.09% |
| B                                | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 25.86% | 48.28%       | 25.86% |
| Caa or below                     | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 30.00%       | 70.00% |
| <b>US CDOs</b>                   |        |        |        |        |        |        |              |        |
| Aaa                              | 65.41% | 9.72%  | 5.31%  | 2.59%  | 0.78%  | 0.78%  | 0.00%        | 15.41% |
| Aa                               | 1.10%  | 49.61% | 10.87% | 13.54% | 6.30%  | 2.52%  | 2.52%        | 13.54% |
| A                                | 0.21%  | 2.48%  | 53.10% | 5.79%  | 6.61%  | 3.93%  | 7.85%        | 20.04% |
| Baa                              | 0.00%  | 0.20%  | 0.41%  | 44.57% | 8.91%  | 9.94%  | 22.23%       | 13.73% |
| Ba                               | 0.00%  | 0.00%  | 0.00%  | 1.68%  | 41.68% | 7.29%  | 37.38%       | 11.96% |
| B                                | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 35.68% | 53.52%       | 10.80% |
| Caa or below                     | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 88.89%       | 11.11% |
| <b>US CDOs excl. HY CBOs</b>     |        |        |        |        |        |        |              |        |
| Aaa                              | 71.81% | 5.60%  | 2.51%  | 0.77%  | 0.39%  | 0.19%  | 0.00%        | 18.73% |
| Aa                               | 1.80%  | 63.40% | 8.76%  | 5.15%  | 1.80%  | 1.03%  | 0.26%        | 17.78% |
| A                                | 0.27%  | 3.25%  | 59.62% | 3.79%  | 3.79%  | 2.17%  | 3.79%        | 23.31% |
| Baa                              | 0.00%  | 0.17%  | 0.50%  | 56.13% | 7.95%  | 6.95%  | 9.93%        | 18.38% |
| Ba                               | 0.00%  | 0.00%  | 0.00%  | 2.94%  | 57.84% | 4.25%  | 16.67%       | 18.30% |
| B                                | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 61.96% | 21.74%       | 16.30% |
| Caa or below                     | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 61.54%       | 38.46% |
| <b>US CMBS</b>                   |        |        |        |        |        |        |              |        |
| Aaa                              | 78.75% | 0.90%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        | 20.35% |
| Aa                               | 18.56% | 54.67% | 1.87%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        | 24.91% |
| A                                | 3.68%  | 9.64%  | 62.51% | 2.60%  | 1.19%  | 0.00%  | 0.00%        | 20.37% |
| Baa                              | 1.15%  | 1.99%  | 7.13%  | 62.42% | 3.60%  | 1.23%  | 0.31%        | 22.16% |
| Ba                               | 0.00%  | 0.67%  | 0.50%  | 2.83%  | 72.67% | 7.67%  | 2.50%        | 13.17% |
| B                                | 0.00%  | 0.00%  | 0.00%  | 0.69%  | 1.22%  | 69.10% | 18.23%       | 10.76% |
| Caa or below                     | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 87.69%       | 12.31% |
| <b>US RMBS</b>                   |        |        |        |        |        |        |              |        |
| Aaa                              | 62.08% | 0.17%  | 0.01%  | 0.00%  | 0.00%  | 0.00%  | 0.04%        | 37.70% |
| Aa                               | 9.74%  | 51.16% | 0.49%  | 0.20%  | 0.00%  | 0.00%  | 0.08%        | 38.32% |
| A                                | 6.33%  | 4.58%  | 55.02% | 0.81%  | 0.07%  | 0.00%  | 0.47%        | 32.73% |
| Baa                              | 2.29%  | 2.73%  | 5.27%  | 58.90% | 0.43%  | 0.43%  | 0.87%        | 29.08% |
| Ba                               | 0.53%  | 0.27%  | 4.51%  | 6.37%  | 55.97% | 0.00%  | 3.05%        | 29.31% |
| B                                | 0.00%  | 0.00%  | 0.00%  | 2.20%  | 1.76%  | 58.37% | 5.95%        | 31.72% |
| Caa or below                     | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 73.66%       | 26.34% |

**Figure 72 - One-Year Rating Transition Matrices by Sector in 2004 (adjusted for withdrawn ratings)**

| <b>Global Structured Finance</b> |         |        |        |        |        |        |              |
|----------------------------------|---------|--------|--------|--------|--------|--------|--------------|
|                                  | Aaa     | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa                              | 99.15%  | 0.33%  | 0.22%  | 0.09%  | 0.11%  | 0.08%  | 0.03%        |
| Aa                               | 6.67%   | 90.52% | 1.46%  | 0.39%  | 0.18%  | 0.30%  | 0.48%        |
| A                                | 1.45%   | 4.56%  | 91.30% | 1.55%  | 0.52%  | 0.17%  | 0.45%        |
| Baa                              | 0.29%   | 0.92%  | 3.70%  | 90.58% | 2.48%  | 0.73%  | 1.29%        |
| Ba                               | 0.19%   | 0.25%  | 1.02%  | 2.92%  | 86.47% | 4.13%  | 5.02%        |
| B                                | 0.00%   | 0.00%  | 0.11%  | 0.22%  | 3.65%  | 81.07% | 14.94%       |
| Caa or below                     | 0.00%   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.70%  | 99.30%       |
| <b>US ABS</b>                    |         |        |        |        |        |        |              |
| Aaa                              | 98.23%  | 0.35%  | 0.52%  | 0.26%  | 0.30%  | 0.26%  | 0.09%        |
| Aa                               | 2.67%   | 92.19% | 1.65%  | 0.74%  | 0.55%  | 0.83%  | 1.38%        |
| A                                | 0.94%   | 2.83%  | 91.83% | 2.22%  | 0.83%  | 0.33%  | 1.00%        |
| Baa                              | 0.19%   | 0.70%  | 1.14%  | 90.55% | 3.43%  | 1.21%  | 2.79%        |
| Ba                               | 0.99%   | 0.33%  | 0.00%  | 1.98%  | 66.67% | 8.25%  | 21.78%       |
| B                                | 0.00%   | 0.00%  | 0.00%  | 0.69%  | 0.00%  | 53.63% | 45.67%       |
| Caa or below                     | 0.00%   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.34%  | 99.66%       |
| <b>US HEL</b>                    |         |        |        |        |        |        |              |
| Aaa                              | 100.00% | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        |
| Aa                               | 2.82%   | 97.05% | 0.00%  | 0.00%  | 0.13%  | 0.00%  | 0.00%        |
| A                                | 0.34%   | 1.95%  | 95.77% | 1.72%  | 0.11%  | 0.00%  | 0.11%        |
| Baa                              | 0.00%   | 0.18%  | 0.82%  | 96.45% | 1.00%  | 1.00%  | 0.55%        |
| Ba                               | 0.00%   | 0.00%  | 0.00%  | 1.71%  | 85.47% | 5.98%  | 6.84%        |
| B                                | 0.00%   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 77.14% | 22.86%       |
| Caa or below                     | 0.00%   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 100.00%      |
| <b>US ABS excl. MH, HEL</b>      |         |        |        |        |        |        |              |
| Aaa                              | 98.95%  | 0.57%  | 0.38%  | 0.10%  | 0.00%  | 0.00%  | 0.00%        |
| Aa                               | 3.77%   | 88.21% | 5.19%  | 1.89%  | 0.00%  | 0.94%  | 0.00%        |
| A                                | 1.53%   | 3.99%  | 91.66% | 1.64%  | 0.94%  | 0.12%  | 0.12%        |
| Baa                              | 0.80%   | 2.39%  | 2.39%  | 80.88% | 9.30%  | 1.86%  | 2.39%        |
| Ba                               | 2.19%   | 0.00%  | 0.00%  | 2.92%  | 70.07% | 7.30%  | 17.52%       |
| B                                | 0.00%   | 0.00%  | 0.00%  | 1.82%  | 0.00%  | 54.55% | 43.64%       |
| Caa or below                     | 0.00%   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.90%  | 99.10%       |
| <b>US CDOs</b>                   |         |        |        |        |        |        |              |
| Aaa                              | 97.81%  | 1.39%  | 0.40%  | 0.20%  | 0.20%  | 0.00%  | 0.00%        |
| Aa                               | 1.40%   | 93.28% | 3.64%  | 1.12%  | 0.00%  | 0.28%  | 0.28%        |
| A                                | 0.00%   | 0.51%  | 97.18% | 1.28%  | 0.51%  | 0.26%  | 0.26%        |
| Baa                              | 0.00%   | 0.00%  | 0.42%  | 94.08% | 1.69%  | 2.11%  | 1.69%        |
| Ba                               | 0.00%   | 0.00%  | 0.00%  | 0.00%  | 94.11% | 2.43%  | 3.47%        |
| B                                | 0.00%   | 0.00%  | 0.00%  | 0.00%  | 2.86%  | 84.76% | 12.38%       |
| Caa or below                     | 0.00%   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 100.00%      |
| <b>US CDOs excl. HY CBOs</b>     |         |        |        |        |        |        |              |
| Aaa                              | 97.50%  | 1.59%  | 0.46%  | 0.23%  | 0.23%  | 0.00%  | 0.00%        |
| Aa                               | 0.94%   | 93.11% | 4.07%  | 1.25%  | 0.00%  | 0.31%  | 0.31%        |
| A                                | 0.00%   | 0.00%  | 97.65% | 1.17%  | 0.59%  | 0.29%  | 0.29%        |
| Baa                              | 0.00%   | 0.00%  | 0.00%  | 94.66% | 0.76%  | 2.54%  | 2.04%        |
| Ba                               | 0.00%   | 0.00%  | 0.00%  | 0.00%  | 94.71% | 2.64%  | 2.64%        |
| B                                | 0.00%   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 79.44% | 20.56%       |
| Caa or below                     | 0.00%   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 100.00%      |
| <b>US CMBS</b>                   |         |        |        |        |        |        |              |
| Aaa                              | 99.55%  | 0.45%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        |
| Aa                               | 13.50%  | 85.48% | 1.02%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        |
| A                                | 3.19%   | 7.17%  | 87.65% | 1.99%  | 0.00%  | 0.00%  | 0.00%        |
| Baa                              | 0.57%   | 1.15%  | 5.87%  | 88.98% | 3.29%  | 0.14%  | 0.00%        |
| Ba                               | 0.00%   | 0.22%  | 0.45%  | 2.46%  | 90.61% | 6.03%  | 0.22%        |
| B                                | 0.00%   | 0.00%  | 0.00%  | 0.00%  | 0.26%  | 86.41% | 13.33%       |
| Caa or below                     | 0.00%   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 100.00%      |
| <b>US RMBS</b>                   |         |        |        |        |        |        |              |
| Aaa                              | 100.00% | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        |
| Aa                               | 15.20%  | 84.80% | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        |
| A                                | 2.83%   | 12.88% | 84.13% | 0.16%  | 0.00%  | 0.00%  | 0.00%        |
| Baa                              | 0.33%   | 2.93%  | 11.87% | 84.55% | 0.33%  | 0.00%  | 0.00%        |
| Ba                               | 0.00%   | 0.69%  | 4.84%  | 9.34%  | 84.78% | 0.00%  | 0.35%        |
| B                                | 0.00%   | 0.00%  | 0.52%  | 0.52%  | 14.51% | 84.46% | 0.00%        |
| Caa or below                     | 0.00%   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 100.00%      |

**Figure 73 - Global Structured Finance One-Year Refined-Rating Transition Matrix in 2004**

|      | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1  | Ba2   | Ba3   | B1    | B2    | B3    | Caa1  | Caa2  | Caa3  | Ca    | C     | WR    |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Aaa  | 7953  | 90.6% | 0.2%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.1%  | 0.1% | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  |       |       | 0.0%  |       |       | 8.6%  |
| Aa1  | 451   | 10.0% | 78.7% | 1.3%  |       |       |       | 0.4%  | 0.2%  |       |       |      |       |       | 0.2%  | 0.2%  |       | 0.2%  |       |       |       |       | 8.6%  |
| Aa2  | 2331  | 6.6%  | 0.9%  | 84.5% | 0.6%  | 0.6%  | 0.2%  | 0.3%  | 0.1%  | 0.1%  | 0.1%  | 0.1% | 0.0%  | 0.0%  | 0.0%  |       | 0.0%  |       |       | 0.0%  | 0.2%  | 0.1%  | 5.4%  |
| Aa3  | 675   | 3.6%  | 1.9%  | 1.8%  | 77.6% | 1.2%  | 1.0%  | 0.6%  | 0.7%  | 0.1%  | 0.1%  | 0.1% | 0.1%  | 0.1%  | 0.1%  | 0.4%  | 0.3%  | 0.1%  |       |       | 0.7%  | 0.3%  | 8.9%  |
| A1   | 712   | 2.8%  | 0.7%  | 1.5%  | 1.8%  | 81.3% | 1.4%  | 0.4%  | 0.6%  | 0.7%  | 0.1%  | 0.3% | 0.3%  |       |       |       |       | 0.1%  |       |       |       | 0.1%  | 7.7%  |
| A2   | 2732  | 1.3%  | 0.7%  | 3.0%  | 1.3%  | 1.1%  | 84.4% | 0.5%  | 0.4%  | 0.5%  | 0.2%  | 0.1% | 0.1%  | 0.0%  | 0.0%  | 0.1%  |       | 0.1%  | 0.1%  |       | 0.2%  |       | 5.9%  |
| A3   | 899   | 0.7%  | 0.4%  | 0.4%  | 1.9%  | 1.7%  | 1.6%  | 81.6% | 0.7%  | 0.6%  | 1.4%  | 0.9% | 0.3%  | 0.1%  | 0.2%  |       | 0.2%  |       |       | 0.1%  | 0.1%  | 0.7%  | 6.3%  |
| Baa1 | 674   | 0.4%  | 0.3%  | 0.3%  | 0.1%  | 0.6%  | 1.0%  | 1.2%  | 83.7% | 1.8%  | 1.3%  | 0.6% | 0.1%  | 0.1%  | 0.4%  |       |       | 0.1%  | 0.1%  | 0.1%  |       | 0.7%  | 6.8%  |
| Baa2 | 2419  | 0.1%  | 0.0%  | 0.2%  | 0.9%  | 0.3%  | 2.6%  | 1.8%  | 0.7%  | 82.1% | 1.5%  | 1.3% | 0.6%  | 0.5%  | 0.2%  | 0.2%  | 0.2%  | 0.1%  | 0.3%  | 0.1%  | 0.2%  | 0.6%  | 5.4%  |
| Baa3 | 1141  | 0.5%  |       | 0.2%  | 0.2%  | 0.2%  | 0.2%  | 1.4%  | 0.9%  | 1.8%  | 82.6% | 1.3% | 1.1%  | 1.1%  | 0.5%  | 0.3%  | 0.2%  | 0.3%  | 0.2%  | 0.4%  | 0.3%  | 0.1%  | 6.4%  |
| Ba1  | 349   |       |       | 0.3%  |       |       |       | 0.3%  | 0.6%  | 0.3%  | 0.6%  | 1.7% | 79.9% | 1.4%  | 0.9%  | 1.1%  | 1.4%  | 1.4%  | 0.3%  | 0.3%  |       | 1.4%  | 6.6%  |
| Ba2  | 847   | 0.4%  | 0.1%  | 0.1%  |       |       |       | 1.5%  | 0.2%  | 2.5%  | 1.1%  | 1.9% | 77.8% | 1.3%  | 1.3%  | 0.9%  | 1.1%  | 0.8%  | 0.8%  | 0.6%  | 0.5%  | 1.8%  | 5.3%  |
| Ba3  | 423   |       |       |       | 0.2%  |       |       |       | 0.2%  |       | 0.9%  | 0.9% | 0.7%  | 79.4% | 1.4%  | 1.9%  | 2.1%  | 1.2%  | 0.5%  | 1.4%  | 0.7%  | 3.1%  | 5.2%  |
| B1   | 208   |       |       |       |       |       |       |       |       |       |       | 0.5% | 0.5%  | 1.0%  | 75.0% | 4.3%  | 8.2%  | 2.9%  | 0.5%  | 0.5%  | 1.0%  | 3.8%  | 1.9%  |
| B2   | 451   |       |       |       |       |       | 0.2%  |       |       |       |       | 2.9% | 2.2%  | 1.1%  | 0.9%  | 72.1% | 2.0%  | 5.3%  | 2.2%  | 0.7%  | 3.3%  | 2.9%  | 4.2%  |
| B3   | 260   |       |       |       |       |       |       |       | 0.4%  |       | 0.4%  |      |       | 0.4%  |       | 1.2%  | 74.6% | 3.1%  | 5.4%  | 1.9%  | 6.2%  | 3.5%  | 3.1%  |
| Caa1 | 109   |       |       |       |       |       |       |       |       |       |       |      |       |       | 2.8%  |       |       | 62.4% | 4.6%  | 4.6%  | 7.3%  | 14.7% | 3.7%  |
| Caa2 | 110   |       |       |       |       |       |       |       |       |       |       |      |       |       |       |       |       | 0.9%  | 70.0% | 4.5%  | 8.2%  | 8.2%  | 8.2%  |
| Caa3 | 85    |       |       |       |       |       |       |       |       |       |       |      |       |       |       |       |       | 1.2%  |       | 68.2% | 8.2%  | 11.8% | 10.6% |
| Ca   | 201   |       |       |       |       |       |       |       |       |       |       |      |       | 0.5%  |       |       | 0.5%  |       |       | 0.5%  | 74.6% | 18.9% | 5.0%  |
| C    | 235   |       |       |       |       |       |       |       |       |       |       |      |       |       |       |       |       |       |       |       |       | 92.8% | 7.2%  |

**Figure 74 - US ABS One-Year Refined-Rating Transition Matrix in 2004**

|      | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2   | B3    | Caa1  | Caa2  | Caa3  | Ca    | C     | WR    |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|
| Aaa  | 2403  | 90.9% | 0.1%  | 0.0%  | 0.2%  | 0.2%  | 0.1%  | 0.2%  | 0.0%  | 0.1%  | 0.1%  | 0.2%  | 0.0%  | 0.1%  | 0.1%  | 0.1% | 0.1%  |       |       | 0.1%  |       |       | 7.4%  |
| Aa1  | 63    | 1.6%  | 92.1% |       |       |       |       |       |       |       |       |       |       |       | 1.6%  |      |       | 1.6%  |       |       |       |       | 3.2%  |
| Aa2  | 869   | 2.6%  | 0.2%  | 91.1% | 0.1%  | 0.5%  | 0.2%  | 0.5%  |       |       | 0.2%  | 0.2%  | 0.1%  | 0.1%  | 0.1%  |      | 0.1%  |       |       | 0.1%  | 0.3%  | 0.2%  | 3.1%  |
| Aa3  | 173   | 2.9%  | 0.6%  | 0.6%  | 75.7% | 1.2%  | 2.3%  | 1.2%  | 2.9%  | 0.6%  | 0.2%  | 0.2%  | 0.1%  | 0.6%  | 0.6%  | 1.7% | 1.2%  | 0.6%  |       |       | 2.9%  | 1.2%  | 2.9%  |
| A1   | 280   | 2.9%  | 1.4%  | 1.4%  | 2.5%  | 80.4% | 0.4%  |       | 0.7%  | 0.7%  | 0.4%  | 0.4%  | 0.7%  |       |       |      |       | 0.4%  |       |       |       | 0.4%  | 7.5%  |
| A2   | 1325  | 0.5%  | 0.4%  | 1.1%  | 0.9%  | 0.5%  | 87.8% | 0.4%  | 0.6%  | 0.8%  | 0.5%  | 0.2%  |       | 0.1%  | 0.1%  | 0.2% |       | 0.2%  | 0.2%  |       |       | 0.4%  | 5.4%  |
| A3   | 249   | 1.2%  | 0.8%  | 0.4%  | 0.8%  | 1.2%  | 0.8%  | 77.1% | 0.8%  | 0.4%  | 2.8%  | 1.6%  | 1.2%  | 0.4%  | 0.4%  |      | 0.8%  |       |       | 0.4%  | 0.4%  | 2.0%  | 6.4%  |
| Baa1 | 235   |       | 0.4%  |       |       |       | 0.4%  |       | 88.5% | 2.1%  | 1.7%  | 0.4%  | 0.4%  | 0.4%  | 1.3%  |      |       | 0.4%  | 0.4%  |       |       | 2.1%  | 1.3%  |
| Baa2 | 964   | 0.1%  |       | 0.4%  | 0.4%  | 0.3%  | 0.7%  | 0.7%  | 0.2%  | 82.9% | 3.1%  | 2.5%  | 1.0%  | 0.5%  | 0.4%  | 0.5% | 0.2%  | 0.2%  | 0.3%  | 0.3%  | 0.5%  | 1.3%  | 3.2%  |
| Baa3 | 401   | 0.5%  |       | 0.2%  | 0.2%  |       |       |       |       | 0.2%  | 88.5% | 0.7%  | 1.5%  | 1.0%  | 0.5%  | 0.5% |       | 0.7%  | 0.5%  | 0.7%  | 0.5%  | 0.2%  | 3.2%  |
| Ba1  | 65    |       |       |       |       |       |       |       |       | 1.5%  |       | 66.2% |       |       | 3.1%  | 1.5% | 4.6%  | 1.5%  | 1.5%  |       | 7.7%  | 7.7%  | 4.6%  |
| Ba2  | 175   | 1.7%  | 0.6%  |       |       |       |       |       | 0.6%  | 0.6%  | 1.1%  | 0.6%  | 64.0% | 1.1%  | 2.3%  | 2.3% | 2.9%  | 3.4%  | 3.4%  | 1.7%  | 1.7%  | 8.0%  | 4.0%  |
| Ba3  | 70    |       |       |       |       |       |       |       | 1.4%  |       |       |       |       | 52.9% |       | 2.9% | 5.7%  | 5.7%  | 1.4%  | 5.7%  | 2.9%  | 15.7% | 5.7%  |
| B1   | 31    |       |       |       |       |       |       |       |       |       |       |       |       |       | 35.5% | 6.5% | 25.8% | 6.5%  | 3.2%  | 3.2%  |       | 19.4% |       |
| B2   | 74    |       |       |       |       |       |       |       |       |       |       |       |       |       | 40.5% | 4.1% | 10.8% | 1.4%  | 1.4%  | 18.9% | 16.2% | 6.8%  |       |
| B3   | 42    |       |       |       |       |       |       |       |       |       | 2.4%  |       |       |       |       |      | 50.0% | 7.1%  | 4.8%  | 2.4%  | 16.7% | 16.7% |       |
| Caa1 | 32    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       | 21.9% | 6.3%  | 12.5% | 18.8% | 40.6% |       |
| Caa2 | 32    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       | 50.0% |       | 12.5% | 25.0% | 12.5% |
| Caa3 | 33    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       | 63.6% | 3.0%  | 24.2% | 9.1%  |
| Ca   | 77    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      | 1.3%  |       |       |       | 53.2% | 37.7% | 7.8%  |
| C    | 132   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |       |       | 94.7% | 5.3%  |

**Figure 75 - US HEL One-Year Refined-Rating Transition Matrix in 2004**

|      | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1     | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1     | B2    | B3     | Caa1   | Caa2  | Caa3  | Ca     | C    | WR    |       |       |       |
|------|-------|-------|-------|-------|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|--------|-------|--------|--------|-------|-------|--------|------|-------|-------|-------|-------|
| Aaa  | 1165  | 96.9% |       |       |       |        |       |       |       |       |       |       |       |       |        |       |        |        |       |       |        |      | 3.1%  |       |       |       |
| Aa1  | 19    | 5.3%  | 94.7% |       |       |        |       |       |       |       |       |       |       |       |        |       |        |        |       |       |        |      |       |       |       |       |
| Aa2  | 713   | 2.8%  |       | 94.2% |       |        |       |       |       |       |       |       |       | 0.1%  |        |       |        |        |       |       |        |      |       | 2.8%  |       |       |
| Aa3  | 25    |       | 4.0%  |       | 80.0% |        |       |       |       |       |       |       |       |       |        |       |        |        |       |       |        |      |       | 16.0% |       |       |
| A1   | 35    |       |       |       |       | 100.0% |       |       |       |       |       |       |       |       |        |       |        |        |       |       |        |      |       |       |       |       |
| A2   | 722   | 0.4%  | 0.3%  | 1.4%  | 0.7%  |        | 91.7% | 0.3%  | 0.6%  | 1.1%  | 0.4%  | 0.1%  |       |       |        |       |        |        |       |       |        | 0.1% |       | 2.9%  |       |       |
| A3   | 128   |       |       |       |       |        |       | 99.2% |       |       |       |       |       |       |        |       |        |        |       |       |        |      |       | 0.8%  |       |       |
| Baa1 | 173   |       |       |       |       |        | 0.6%  |       | 97.1% |       |       |       |       |       | 0.6%   | 0.6%  |        |        |       |       |        |      |       | 1.2%  |       |       |
| Baa2 | 641   |       |       | 0.2%  | 0.2%  |        | 0.8%  | 0.5%  | 0.2%  | 92.5% |       | 0.5%  | 0.5%  | 0.5%  | 0.3%   | 0.8%  | 0.2%   | 0.2%   |       |       |        |      | 0.2%  | 2.8%  |       |       |
| Baa3 | 301   |       |       |       |       |        |       |       |       |       | 94.4% |       |       |       |        |       |        |        |       |       |        |      | 0.7%  | 0.7%  | 3.3%  |       |
| Ba1  | 29    |       |       |       |       |        |       |       |       |       |       | 89.7% |       |       |        |       |        |        |       |       |        |      |       | 3.4%  | 6.9%  |       |
| Ba2  | 78    |       |       |       |       |        |       |       |       |       | 2.6%  | 1.3%  | 73.1% | 1.3%  | 3.8%   | 1.3%  | 3.8%   | 2.6%   | 2.6%  |       |        |      | 1.3%  | 1.3%  | 5.1%  |       |
| Ba3  | 14    |       |       |       |       |        |       |       |       |       |       |       |       | 78.6% |        |       |        |        |       |       |        |      |       | 7.1%  | 14.3% |       |
| B1   | 4     |       |       |       |       |        |       |       |       |       |       |       |       |       | 100.0% |       |        |        |       |       |        |      |       |       |       |       |
| B2   | 29    |       |       |       |       |        |       |       |       |       |       |       |       |       |        | 58.6% |        |        |       |       |        |      |       | 13.8% | 13.8% | 13.8% |
| B3   | 4     |       |       |       |       |        |       |       |       |       |       |       |       |       |        |       | 100.0% |        |       |       |        |      |       |       |       |       |
| Caa1 | 1     |       |       |       |       |        |       |       |       |       |       |       |       |       |        |       |        | 100.0% |       |       |        |      |       |       |       |       |
| Caa2 | 9     |       |       |       |       |        |       |       |       |       |       |       |       |       |        |       |        |        | 88.9% |       |        |      |       |       | 11.1% |       |
| Caa3 | 10    |       |       |       |       |        |       |       |       |       |       |       |       |       |        |       |        |        |       | 90.0% |        |      |       | 10.0% |       |       |
| Ca   | 14    |       |       |       |       |        |       |       |       |       |       |       |       |       |        |       |        |        |       |       | 100.0% |      |       |       |       |       |
| C    | 8     |       |       |       |       |        |       |       |       |       |       |       |       |       |        |       |        |        |       |       |        |      | 75.0% | 25.0% |       |       |

**Figure 76 - US ABS (excl. MH, HEL) One-Year Refined-Rating Transition Matrix in 2004**

|      | Total | Aaa   | Aa1   | Aa2   | Aa3  | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2   | B3    | Caa1  | Caa2  | Caa3  | Ca    | C     | WR    |       |
|------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|
| Aaa  | 1121  | 86.4% | 0.3%  |       | 0.3% | 0.1%  | 0.1%  | 0.2%  |       | 0.1%  |       |       |       |       |       |      |       |       |       |       |       |       | 12.6% |       |
| Aa1  | 34    |       | 94.1% |       |      |       |       |       |       |       |       |       |       |       |       |      |       |       |       |       |       |       |       | 5.9%  |
| Aa2  | 104   | 2.9%  | 1.9%  | 77.9% | 1.0% | 3.8%  | 1.0%  | 2.9%  |       |       |       |       |       |       | 1.0%  |      | 1.0%  |       |       |       |       |       |       | 6.7%  |
| Aa3  | 79    | 6.3%  | 1.3%  | 82.3% | 1.3% | 2.5%  | 5.1%  |       |       |       |       |       |       |       |       |      |       |       |       |       |       |       |       | 1.3%  |
| A1   | 238   | 2.9%  | 1.7%  | 1.7%  | 2.9% | 79.0% |       |       | 0.8%  | 0.4%  | 0.4%  | 0.4%  | 0.8%  |       |       |      |       |       |       |       |       |       |       | 8.8%  |
| A2   | 560   | 0.5%  | 0.5%  | 0.7%  | 1.3% | 1.1%  | 85.2% |       | 0.4%  | 0.5%  | 0.2%  | 0.2%  |       |       |       | 0.2% |       | 0.2%  |       |       |       |       |       | 9.1%  |
| A3   | 97    | 3.1%  | 2.1%  | 1.0%  | 2.1% | 3.1%  | 2.1%  | 62.9% |       |       | 4.1%  | 1.0%  | 2.1%  | 1.0%  |       |      |       |       |       |       |       |       |       | 15.5% |
| Baa1 | 45    |       | 2.2%  |       |      |       |       |       | 75.6% | 11.1% |       | 2.2%  | 2.2%  |       |       | 2.2% |       |       |       |       |       |       |       | 2.2%  |
| Baa2 | 247   | 0.4%  |       | 1.2%  | 1.2% | 1.2%  | 0.8%  | 1.6%  | 0.4%  | 64.0% | 11.7% | 7.7%  | 2.0%  |       | 0.8%  |      | 0.4%  |       |       | 0.8%  | 0.4%  |       |       | 5.3%  |
| Baa3 | 93    | 2.2%  |       | 1.1%  | 1.1% |       |       |       |       | 1.1%  | 73.1% | 2.2%  | 5.4%  | 2.2%  | 2.2%  | 1.1% |       | 3.2%  | 1.1%  | 1.1%  |       |       |       | 3.2%  |
| Ba1  | 23    |       |       |       |      |       |       |       |       | 4.3%  |       | 56.5% |       |       | 4.3%  |      | 13.0% | 4.3%  |       |       |       | 13.0% |       | 4.3%  |
| Ba2  | 74    | 4.1%  |       |       |      |       |       |       | 1.4%  | 1.4%  |       |       | 73.0% |       | 1.4%  | 4.1% | 1.4%  | 2.7%  | 4.1%  | 2.7%  |       |       |       | 4.1%  |
| Ba3  | 43    |       |       |       |      |       |       |       | 2.3%  |       |       |       |       | 60.5% |       |      | 2.3%  | 9.3%  | 9.3%  | 2.3%  | 9.3%  |       |       | 4.7%  |
| B1   | 10    |       |       |       |      |       |       |       |       |       |       |       |       |       | 30.0% |      | 30.0% | 10.0% | 10.0% | 10.0% |       | 10.0% |       | 10.0% |
| B2   | 28    |       |       |       |      |       |       |       |       |       |       |       |       |       | 46.4% |      |       |       |       |       |       |       |       |       |
| B3   | 17    |       |       |       |      |       |       |       |       |       | 5.9%  |       |       |       |       |      | 64.7% | 11.8% |       | 5.9%  | 5.9%  | 5.9%  |       | 5.9%  |
| Caa1 | 25    |       |       |       |      |       |       |       |       |       |       |       |       |       |       |      |       | 16.0% | 4.0%  | 16.0% | 20.0% | 44.0% |       |       |
| Caa2 | 14    |       |       |       |      |       |       |       |       |       |       |       |       |       |       |      |       |       | 57.1% |       | 14.3% | 7.1%  | 21.4% |       |
| Caa3 | 22    |       |       |       |      |       |       |       |       |       |       |       |       |       |       |      |       |       |       | 54.5% | 4.5%  | 27.3% | 13.6% |       |
| Ca   | 30    |       |       |       |      |       |       |       |       |       |       |       |       |       |       |      | 3.3%  |       |       |       | 56.7% | 23.3% | 16.7% |       |
| C    | 28    |       |       |       |      |       |       |       |       |       |       |       |       |       |       |      |       |       |       |       |       | 85.7% | 14.3% |       |

**Figure 77 - US CDOs One-Year Refined-Rating Transition Matrix in 2004**

|      | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1  | Caa2  | Caa3  | Ca    | C     | WR    |       |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Aaa  | 518   | 91.7% | 0.4%  | 0.4%  | 0.6%  | 0.2%  |       | 0.2%  |       |       | 0.2%  | 0.2%  |       |       |       |       |       |       |       |       |       |       | 6.2%  |       |
| Aa1  | 77    | 2.6%  | 81.8% | 3.9%  |       |       | 1.3%  | 1.3%  |       |       |       |       |       |       | 1.3%  |       |       |       |       |       |       |       |       | 7.8%  |
| Aa2  | 214   | 1.4%  |       | 87.9% | 1.9%  | 1.9%  | 0.5%  | 1.4%  | 0.9%  | 0.5%  |       |       |       |       |       |       |       |       |       |       | 0.5%  |       |       | 3.3%  |
| Aa3  | 76    |       |       |       | 85.5% | 1.3%  | 1.3%  | 1.3%  |       |       | 1.3%  |       |       |       |       |       |       |       |       |       |       |       |       | 9.2%  |
| A1   | 74    |       |       | 1.4%  |       | 93.2% | 1.4%  |       | 1.4%  | 1.4%  |       |       |       |       |       |       |       |       |       |       |       |       |       | 1.4%  |
| A2   | 159   |       |       |       |       |       | 91.8% |       |       |       |       |       | 1.3%  |       |       |       |       |       |       |       |       |       |       | 6.9%  |
| A3   | 166   |       |       |       | 0.6%  |       |       | 92.2% |       | 0.6%  | 1.2%  |       |       | 0.6%  |       |       |       |       |       |       |       | 0.6%  |       | 4.2%  |
| Baa1 | 62    |       |       |       |       | 1.6%  |       |       | 83.9% |       | 3.2%  |       |       |       |       |       |       |       |       |       |       |       |       | 11.3% |
| Baa2 | 311   |       |       |       |       |       |       | 0.3%  |       | 92.0% | 0.3%  | 0.3%  |       | 1.0%  | 0.6%  |       | 0.6%  | 0.3%  | 1.3%  |       |       |       | 0.3%  | 2.9%  |
| Baa3 | 113   |       |       |       |       |       |       |       |       |       | 80.5% | 1.8%  | 1.8%  |       | 3.5%  | 0.9%  | 0.9%  |       |       | 0.9%  | 0.9%  |       | 0.9%  | 8.8%  |
| Ba1  | 49    |       |       |       |       |       |       |       |       |       |       | 89.8% | 2.0%  |       | 4.1%  | 2.0%  |       |       |       |       |       |       |       | 2.0%  |
| Ba2  | 151   |       |       |       |       |       |       |       |       |       |       | 0.7%  | 90.1% | 0.7%  | 0.7%  | 0.7%  | 0.7%  | 0.7%  | 0.7%  | 0.7%  | 0.7%  | 0.7%  | 0.7%  | 4.0%  |
| Ba3  | 96    |       |       |       |       |       |       |       |       |       |       |       |       | 84.4% | 1.0%  |       |       |       |       | 1.0%  | 2.1%  | 1.0%  | 2.1%  | 8.3%  |
| B1   | 40    |       |       |       |       |       |       |       |       |       |       | 2.5%  | 2.5%  |       | 82.5% | 5.0%  | 2.5%  |       |       |       |       |       |       | 5.0%  |
| B2   | 42    |       |       |       |       |       |       |       |       |       |       |       | 2.4%  |       |       | 76.2% |       | 4.8%  | 4.8%  | 2.4%  |       | 2.4%  |       | 7.1%  |
| B3   | 25    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 76.0% |       | 4.0%  |       | 8.0%  | 8.0%  |       | 4.0%  |
| Caa1 | 16    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 68.8% |       | 6.3%  | 6.3%  | 18.8% |       |       |
| Caa2 | 26    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 76.9% | 3.8%  | 7.7%  |       |       | 11.5% |
| Caa3 | 32    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 3.1%  |       | 62.5% | 15.6% | 6.3%  | 12.5% |       |
| Ca   | 70    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 90.0% | 10.0% |       |       |
| C    | 83    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 96.4% | 3.6%  |       |

**Figure 78 - US CDOs (excl. HY CBOs) One-Year Refined-Rating Transition Matrix in 2004**

|      | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1  | Caa2  | Caa3  | Ca     | C     | WR    |       |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|-------|-------|-------|
| Aaa  | 453   | 91.6% | 0.4%  | 0.4%  | 0.7%  | 0.2%  |       | 0.2%  |       |       | 0.2%  | 0.2%  |       |       |       |       |       |       |       |       |        |       | 6.0%  |       |
| Aa1  | 66    | 1.5%  | 83.3% | 3.0%  |       |       | 1.5%  | 1.5%  |       |       |       |       |       |       | 1.5%  |       |       |       |       |       |        |       |       | 7.6%  |
| Aa2  | 197   | 1.0%  |       | 88.3% | 1.0%  | 2.0%  | 0.5%  | 1.5%  | 1.0%  | 0.5%  |       |       |       |       |       |       |       |       |       |       | 0.5%   |       |       | 3.6%  |
| Aa3  | 66    |       |       |       | 83.3% | 1.5%  | 1.5%  | 1.5%  |       |       | 1.5%  |       |       |       |       |       |       |       |       |       |        |       |       | 10.6% |
| A1   | 62    |       |       |       |       | 95.2% |       |       | 1.6%  | 1.6%  |       |       |       |       |       |       |       |       |       |       |        |       |       | 1.6%  |
| A2   | 150   |       |       |       |       |       | 92.7% |       |       |       |       |       | 1.3%  |       |       |       |       |       |       |       |        |       |       | 6.0%  |
| A3   | 136   |       |       |       |       |       |       | 93.4% |       | 0.7%  | 0.7%  |       |       |       | 0.7%  |       |       |       |       |       |        |       | 0.7%  | 3.7%  |
| Baa1 | 47    |       |       |       |       |       |       |       | 89.4% |       | 2.1%  |       |       |       |       |       |       |       |       |       |        |       |       | 8.5%  |
| Baa2 | 276   |       |       |       |       |       |       |       |       | 92.4% | 0.4%  |       |       | 0.7%  | 0.7%  |       | 0.7%  | 0.4%  | 1.4%  |       |        |       | 0.4%  | 2.9%  |
| Baa3 | 81    |       |       |       |       |       |       |       |       |       | 76.5% |       | 1.2%  | 4.9%  | 1.2%  | 1.2%  |       |       |       | 1.2%  | 1.2%   |       | 1.2%  | 12.3% |
| Ba1  | 34    |       |       |       |       |       |       |       |       |       |       | 88.2% | 2.9%  | 2.9%  | 2.9%  |       |       |       |       |       |        |       |       | 2.9%  |
| Ba2  | 127   |       |       |       |       |       |       |       |       |       |       |       | 91.3% | 0.8%  | 0.8%  | 0.8%  | 0.8%  |       | 0.8%  | 0.8%  |        |       | 0.8%  | 3.1%  |
| Ba3  | 72    |       |       |       |       |       |       |       |       |       |       |       |       | 84.7% | 1.4%  |       |       |       |       |       |        | 1.4%  | 2.8%  | 9.7%  |
| B1   | 14    |       |       |       |       |       |       |       |       |       |       |       |       |       | 85.7% |       |       |       |       |       |        |       |       | 14.3% |
| B2   | 26    |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 73.1% |       | 3.8%  | 7.7%  | 3.8%  |        |       | 3.8%  | 7.7%  |
| B3   | 15    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 66.7% |       | 6.7%  |       | 6.7%   | 13.3% | 6.7%  |       |
| Caa1 | 6     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 83.3% |       |       |        |       |       | 16.7% |
| Caa2 | 11    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 63.6% | 9.1%  |        |       |       | 27.3% |
| Caa3 | 15    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 60.0% | 26.7%  |       |       | 13.3% |
| Ca   | 14    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 100.0% |       |       |       |
| C    | 12    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |        |       | 83.3% | 16.7% |



**Figure 79 - US CMBS One-Year Refined-Rating Transition Matrix in 2004**

|      | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1  | Caa2  | Caa3  | Ca    | C     | WR    |       |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Aaa  | 691   | 91.9% | 0.4%  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 7.7%  |       |
| Aa1  | 52    | 23.1% | 59.6% | 1.9%  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 15.4% |
| Aa2  | 270   | 12.6% | 3.7%  | 74.4% | 0.7%  | 0.4%  | 0.7%  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 7.4%  |
| Aa3  | 89    | 7.9%  | 5.6%  | 2.2%  | 73.0% |       |       | 1.1%  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 10.1% |
| A1   | 70    | 10.0% | 1.4%  | 4.3%  | 5.7%  | 64.3% |       |       | 1.4%  |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 12.9% |
| A2   | 245   | 2.9%  | 3.7%  | 2.4%  | 3.3%  | 5.3%  | 74.3% | 1.6%  | 0.4%  | 0.8%  |       |       |       |       |       |       |       |       |       |       |       |       |       | 5.3%  |
| A3   | 204   | 1.0%  | 0.5%  | 1.0%  | 1.0%  | 4.4%  | 4.9%  | 78.4% | 1.0%  | 0.5%  | 1.5%  |       |       |       |       |       |       |       |       |       |       |       |       | 5.9%  |
| Baa1 | 163   | 1.8%  | 0.6%  | 0.6%  |       | 1.2%  | 1.8%  | 3.1%  | 71.8% | 1.2%  |       | 1.8%  |       |       |       |       |       |       |       |       |       |       |       | 16.0% |
| Baa2 | 296   | 0.3%  | 0.3%  | 0.3%  | 0.7%  | 0.7%  | 3.4%  | 3.7%  | 3.4%  | 71.6% | 1.0%  | 1.4%  | 1.4%  |       |       |       |       |       |       |       |       |       |       | 11.8% |
| Baa3 | 287   |       |       | 0.3%  | 0.3%  | 0.7%  | 0.3%  | 1.7%  | 2.1%  | 5.6%  | 72.5% | 1.7%  | 0.3%  | 2.1%  |       |       | 0.3%  |       |       |       |       |       |       | 11.8% |
| Ba1  | 138   |       |       | 0.7%  |       |       | 0.7%  | 0.7%  |       |       |       | 82.6% | 2.9%  | 0.7%  |       | 0.7%  | 1.4%  |       |       |       |       |       |       | 5.1%  |
| Ba2  | 173   |       |       |       |       |       |       |       | 0.6%  | 0.6%  | 1.7%  | 1.2%  | 82.7% | 3.5%  | 3.5%  | 1.2%  | 1.2%  |       |       |       |       |       |       | 4.0%  |
| Ba3  | 147   |       |       |       |       |       |       |       |       |       |       | 1.4%  | 0.7%  | 83.0% | 3.4%  | 2.7%  | 3.4%  | 0.7%  |       |       |       |       |       | 4.8%  |
| B1   | 111   |       |       |       |       |       |       |       |       |       |       |       |       | 0.9%  | 82.0% | 3.6%  | 6.3%  | 2.7%  |       |       |       | 1.8%  |       | 2.7%  |
| B2   | 144   |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 79.9% | 3.5%  | 9.0%  | 4.9%  | 0.7%  |       |       |       | 2.1%  |
| B3   | 132   |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 0.8%  | 78.0% | 3.0%  | 8.3%  | 3.0%  | 4.5%  |       |       | 2.3%  |
| Caa1 | 14    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 78.6% |       |       |       |       |       | 14.3% |
| Caa2 | 33    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 3.0%  | 72.7% | 9.1%  | 9.1%  | 3.0%  |       | 3.0%  |
| Caa3 | 5     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 40.0% | 20.0% |       |       | 40.0% |
| Ca   | 4     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 75.0% | 25.0% |       |
| C    | 10    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 40.0% | 60.0% |

**Figure 80 - US RMBS One-Year Refined-Rating Transition Matrix in 2004**

|      | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1     | B2    | B3    | Caa1  | Caa2  | Caa3   | Ca | C     | WR     |       |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|-------|-------|-------|-------|--------|----|-------|--------|-------|
| Aaa  | 2817  | 91.4% |       |       |       |       |       |       |       |       |       |       |       |       |        |       |       |       |       |        |    |       | 8.6%   |       |
| Aa1  | 110   | 22.7% | 67.3% |       |       |       |       |       |       |       |       |       |       |       |        |       |       |       |       |        |    |       |        | 10.0% |
| Aa2  | 548   | 14.6% | 0.4%  | 79.2% |       |       |       |       |       |       |       |       |       |       |        |       |       |       |       |        |    |       |        | 5.8%  |
| Aa3  | 118   | 7.6%  | 2.5%  | 1.7%  | 80.5% |       |       |       |       |       |       |       |       |       |        |       |       |       |       |        |    |       |        | 7.6%  |
| A1   | 48    | 6.3%  |       |       |       | 77.1% |       |       |       |       |       |       |       |       |        |       |       |       |       |        |    |       |        | 16.7% |
| A2   | 473   | 3.0%  | 1.3%  | 11.8% | 1.7%  | 0.6%  | 75.3% |       |       | 0.2%  |       |       |       |       |        |       |       |       |       |        |    |       |        | 6.1%  |
| A3   | 136   | 0.7%  | 0.7%  | 0.7%  | 7.4%  | 1.5%  | 0.7%  | 85.3% |       |       |       |       |       |       |        |       |       |       |       |        |    |       |        | 2.9%  |
| Baa1 | 36    |       |       | 2.8%  | 2.8%  |       | 2.8%  |       | 86.1% |       |       |       |       |       |        |       |       |       |       |        |    |       |        | 5.6%  |
| Baa2 | 412   | 0.2%  |       |       | 3.9%  | 0.2%  | 10.7% | 3.9%  | 0.2%  | 74.8% |       |       | 0.2%  | 0.2%  |        |       |       |       |       |        |    |       |        | 5.6%  |
| Baa3 | 183   | 0.5%  |       |       |       |       | 0.5%  | 5.5%  | 1.6%  |       | 88.0% |       |       |       |        |       |       |       |       |        |    |       |        | 3.8%  |
| Ba1  | 17    |       |       |       |       |       |       | 5.9%  | 5.9%  |       |       | 70.6% |       |       |        |       |       |       |       |        |    |       |        | 17.6% |
| Ba2  | 221   |       |       | 0.5%  |       |       |       | 5.9%  |       | 8.1%  | 1.8%  | 5.0%  | 73.3% |       |        |       |       |       |       |        |    | 0.5%  |        | 5.0%  |
| Ba3  | 58    |       |       |       | 1.7%  |       |       |       |       |       | 6.9%  | 1.7%  | 1.7%  | 87.9% |        |       |       |       |       |        |    |       |        |       |
| B1   | 5     |       |       |       |       |       |       |       |       |       |       |       |       |       | 100.0% |       |       |       |       |        |    |       |        |       |
| B2   | 160   |       |       |       |       |       | 0.6%  |       |       |       |       | 8.1%  | 5.6%  | 3.1%  | 2.5%   | 76.9% |       |       |       |        |    |       |        | 3.1%  |
| B3   | 31    |       |       |       |       |       |       |       | 3.2%  |       |       |       |       | 3.2%  |        |       | 90.3% |       |       |        |    |       |        | 3.2%  |
| Caa1 | 35    |       |       |       |       |       |       |       |       |       |       |       |       |       |        |       |       | 97.1% |       |        |    |       |        | 2.9%  |
| Caa2 | 12    |       |       |       |       |       |       |       |       |       |       |       |       |       |        |       |       |       | 91.7% |        |    |       |        | 8.3%  |
| Caa3 | 7     |       |       |       |       |       |       |       |       |       |       |       |       |       |        |       |       |       |       | 100.0% |    |       |        |       |
| Ca   | 33    |       |       |       |       |       |       |       |       |       |       |       |       |       |        |       |       |       |       |        |    | 90.9% |        | 9.1%  |
| C    | 5     |       |       |       |       |       |       |       |       |       |       |       |       |       |        |       |       |       |       |        |    |       | 100.0% |       |

## Related Research

### **Special Comments:**

[Structured Finance Rating Transitions: 1983-2003, February 2004 \(81239\)](#)

[Structured Finance Rating Transitions: 1983-2002, Comparisons with Corporate Ratings and Across Sectors, January 2003 \(77291\)](#)

[Default & Loss Rates of Structured Finance Securities: 1993-2004:H1, January 2005 \(90843\)](#)

[Default & Loss Rates of Structured Finance Securities: 1993-2003, September 2004 \(88692\)](#)

[Structured Finance Watchlist Resolutions: 1992-2003, June 2004 \(87305\)](#)

[Measuring Loss Severity Rates of Defaulted Residential Mortgage Backed Securities, April 2004 \(88769\)](#)

[Payment Defaults and Material Impairments of U.S. Structured Finance Securities: 1993-2002, December 2003 \(80247\)](#)

[Guide to Moody's Default Research, November 2004 \(89650\)](#)

[The Performance of Moody's Corporate Bond Ratings: December 2004 Quarterly Update, January 2005 \(91196\)](#)

[Default and Recovery Rates of Corporate Bond Issuers, 1920-2004, January 2005 \(91233\)](#)

[Moody's Rating Actions, Reviews, and Outlooks: Quarterly Update, January 2005 \(91285\)](#)

### **Structured Finance Special Reports:**

[Credit Shifts in Residential Mortgage Pass-Through Securities: A Rating Transition Study Update, May 1996 \(SF4439\)](#)

[How and Why do Structured Finance Ratings Change? Rating Transition Study for Single-Family Residential MPT Securities, May 1995 \(SF3380\)](#)

[2004 Review and 2005 Outlook: US ABS, January 2005 \(SF49728\)](#)

[2004 Review and 2005 Outlook: Commercial ABS, January 2005 \(SF49699\)](#)

[2004 Review & 2005 Outlook: Home Equity ABS HEL Volume Soars to Heavenly Heights, January 2005 \(SF49250\)](#)

[2004 Review and 2005 Outlook: Manufactured Housing Asset Backed Securities, January 2005 \(SF49729\)](#)

[Rating Changes in the US Asset-Backed Securities Market: 2004 Third Quarter Update, November 2004 \(SF46183\)](#)

[Rating Changes in the US Asset-Backed Securities Market: 2004 Second Quarter Update, July 2004 \(SF41522\)](#)

[Rating Changes in the US Asset-Backed Securities Market: 2004 First Quarter Update, April 2004 \(SF35819\)](#)

[Third Quarter 2004 US CDO Review: CLOs Drives Third Quarter Growth, November 2004 \(SF46261\)](#)

[Second Quarter 2004 US CDO Review: Demand for CDO Liabilities Continue to Drive, August 2004 \(SF41915\)](#)

[First Quarter 2004 US CDO Review: Demand for CDO Paper Picks Up, April 2004 \(SF35880\)](#)

[U.S. CMBS 3Q 04: Conduit Lending Remains "Frothy" but a Few Bright Spots Emerge, October 2004 \(SF45949\)](#)

[U.S. CMBS 2Q 04: The Credit Pendulum Has Swung to "Frothy", July 2004 \(SF41837\)](#)

[CMBS 1Q 04: Past Performance is No Guarantee for Future Results, April 2004 \(SF35827\)](#)

[Rating Actions in the U.S. CDO Market: Year-to-Date Review – June 2004, August 2004 \(SF41947\)](#)

[Credit Migration of CDO Notes, 1996-2003, for US and European Transactions, March 2004 \(SF33189\)](#)

[Europe, Middle East and Africa Structured Finance Rating Transitions: 2003 Update, February 2004 \(SF32810\)](#)

[Japanese Structured Finance Rating Transitions: 1998-2003, April 2004 \(SF34841\)](#)

*To access any of these reports, click on the entry above. Note that these references are current as of the date of publication of this report and that more recent reports may be available. All research may not be available to all clients.*

To order reprints of this report (100 copies minimum), please call 1.212.553.1658.  
Report Number: 91392

| <b>Author</b>  | <b>Editor</b>         | <b>Associate Analyst</b> | <b>Production Associate</b> |
|----------------|-----------------------|--------------------------|-----------------------------|
| <i>Jian Hu</i> | <i>Michael D'Arcy</i> | <i>Alexandra Neely</i>   | <i>Tara Loewenberger</i>    |

© Copyright 2005, Moody's Investors Service, Inc. and/or its licensors including Moody's Assurance Company, Inc. (together, "MOODY'S"). All rights reserved. **ALL INFORMATION CONTAINED HEREIN IS PROTECTED BY COPYRIGHT LAW AND NONE OF SUCH INFORMATION MAY BE COPIED OR OTHERWISE REPRODUCED, REPACKAGED, FURTHER TRANSMITTED, TRANSFERRED, DISSEMINATED, REDISTRIBUTED OR RESOLD, OR STORED FOR SUBSEQUENT USE FOR ANY SUCH PURPOSE, IN WHOLE OR IN PART, IN ANY FORM OR MANNER OR BY ANY MEANS WHATSOEVER, BY ANY PERSON WITHOUT MOODY'S PRIOR WRITTEN CONSENT.** All information contained herein is obtained by MOODY'S from sources believed by it to be accurate and reliable. Because of the possibility of human or mechanical error as well as other factors, however, such information is provided "as is" without warranty of any kind and MOODY'S, in particular, makes no representation or warranty, express or implied, as to the accuracy, timeliness, completeness, merchantability or fitness for any particular purpose of any such information. Under no circumstances shall MOODY'S have any liability to any person or entity for (a) any loss or damage in whole or in part caused by, resulting from, or relating to, any error (negligent or otherwise) or other circumstance or contingency within or outside the control of MOODY'S or any of its directors, officers, employees or agents in connection with the procurement, collection, compilation, analysis, interpretation, communication, publication or delivery of any such information, or (b) any direct, indirect, special, consequential, compensatory or incidental damages whatsoever (including without limitation, lost profits), even if MOODY'S is advised in advance of the possibility of such damages, resulting from the use of or inability to use, any such information. The credit ratings and financial reporting analysis observations, if any, constituting part of the information contained herein are, and must be construed solely as, statements of opinion and not statements of fact or recommendations to purchase, sell or hold any securities. **NO WARRANTY, EXPRESS OR IMPLIED, AS TO THE ACCURACY, TIMELINESS, COMPLETENESS, MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OF ANY SUCH RATING OR OTHER OPINION OR INFORMATION IS GIVEN OR MADE BY MOODY'S IN ANY FORM OR MANNER WHATSOEVER.** Each rating or other opinion must be weighed solely as one factor in any investment decision made by or on behalf of any user of the information contained herein, and each such user must accordingly make its own study and evaluation of each security and of each issuer and guarantor of, and each provider of credit support for, each security that it may consider purchasing, holding or selling.

MOODY'S hereby discloses that most issuers of debt securities (including corporate and municipal bonds, debentures, notes and commercial paper) and preferred stock rated by MOODY'S have, prior to assignment of any rating, agreed to pay to MOODY'S for appraisal and rating services rendered by it fees ranging from \$1,500 to \$2,400,000. Moody's Corporation (MCO) and its wholly-owned credit rating agency subsidiary, Moody's Investors Service (MIS), also maintain policies and procedures to address the independence of MIS's ratings and rating processes. Information regarding certain affiliations that may exist between directors of MCO and rated entities, and between entities who hold ratings from MIS and have also publicly reported to the SEC an ownership interest in MCO of more than 5%, is posted annually on Moody's website at [www.moody.com](http://www.moody.com) under the heading "Shareholder Relations — Corporate Governance — Director and Shareholder Affiliation Policy."

## Contact

## Phone

***New York***

Julia Tung  
 Jian Hu  
 Richard Cantor  
 Nicolas Weill  
 Gus Harris  
 Tad Philipp  
 Frederic Drevon

1.212.553.1653

## Structured Finance Rating Transitions: 1983-2005

### Summary Opinion

This is Moody's fourth annual global structured finance ratings transition study. We review the 2005 and historical transition rates both on an aggregate basis and within key asset classes and provide comparisons to the corporate rating transition experience.

The performance of global structured finance credits improved in 2005 relative to 2004 by almost all measures, with a decline in the frequency and magnitude of downgrades, an increase in upgrade rates, and a decline in migration rates from other rating categories to Caa or below. These improvements were broad-based, affecting almost all sectors and regions.

**Figure 1 – Global Structured Finance Annual Downgrade and Upgrade Rates by Sector in 2005, 2004, and Averaged over 1996-2005<sup>1</sup>**

|                                    | Downgrade Rate |       |           | Upgrade Rate |       |           |
|------------------------------------|----------------|-------|-----------|--------------|-------|-----------|
|                                    | 2005           | 2004  | 1996-2005 | 2005         | 2004  | 1996-2005 |
| US ABS                             | 1.8%           | 8.5%  | 5.0%      | 3.0%         | 2.0%  | 1.9%      |
| US MH                              | 0.7%           | 38.0% | 15.6%     | 8.3%         | 0.1%  | 2.7%      |
| US HEL                             | 1.8%           | 2.0%  | 2.1%      | 2.0%         | 1.5%  | 1.7%      |
| US Autos                           | 0.0%           | 0.3%  | 1.5%      | 12.6%        | 17.0% | 6.4%      |
| US Credit Cards                    | 0.0%           | 0.0%  | 0.8%      | 4.2%         | 0.4%  | 1.6%      |
| US Student Loans                   | 0.0%           | 0.0%  | 0.0%      | 5.2%         | 0.8%  | 1.5%      |
| US CDOs                            | 3.0%           | 5.6%  | 9.7%      | 1.6%         | 0.6%  | 0.8%      |
| US HY CBOs                         | 1.0%           | 7.4%  | 19.4%     | 4.8%         | 2.3%  | 1.3%      |
| US HY CLOs                         | 0.2%           | 0.3%  | 2.5%      | 0.5%         | 0.3%  | 0.3%      |
| US Resecuritization CDOs           | 9.7%           | 15.6% | 10.1%     | 1.6%         | 0.0%  | 0.8%      |
| US Synthetic Arbitrage CDOs        | 1.7%           | 0.9%  | 9.4%      | 0.3%         | 0.0%  | 0.3%      |
| US CMBS                            | 3.5%           | 5.7%  | 3.5%      | 16.4%        | 8.8%  | 8.7%      |
| US RMBS                            | 0.9%           | 0.1%  | 1.2%      | 6.8%         | 8.8%  | 5.2%      |
| US Structured Finance              | 2.0%           | 5.5%  | 4.1%      | 5.9%         | 4.7%  | 3.9%      |
| European Structured Finance        | 2.0%           | 4.0%  | 4.7%      | 7.3%         | 1.8%  | 3.7%      |
| Asia-Pacific Structured Finance    | 0.4%           | 0.2%  | 1.5%      | 7.7%         | 7.3%  | 5.1%      |
| Non-US Americas Structured Finance | 0.7%           | 1.1%  | 6.4%      | 5.8%         | 2.6%  | 4.9%      |
| Global Structured Finance          | 1.9%           | 5.0%  | 4.1%      | 6.2%         | 4.4%  | 3.9%      |
| Global Corporate <sup>2</sup>      | 8.3%           | 8.1%  | 13.2%     | 13.8%        | 13.3% | 9.7%      |

1. All downgrade and upgrade rates are adjusted for withdrawn ratings by removing half of the withdrawn ratings from the ratings population outstanding at the beginning of each year. The Appendix contains transition rates by rating that are unadjusted for withdrawals.

2. This figure includes international corporate and sovereign issuers, but excludes municipal ratings.

Key findings in the report include:

- Worldwide, structured finance securities experienced roughly three rating upgrades per rating downgrade in 2005, a substantial improvement over 2004 when the downgrade-to-upgrade ratio<sup>3</sup> was approximately 1:1. Altogether, 514 ratings from 258 deals were downgraded and 1641 ratings from 683 deals were upgraded over the year. The downgrade rate dropped to 1.9% in 2005 from 5.0% the previous year, and the upgrade rate increased to 6.2% from 4.4%.
- The average number of notches that the rating of a downgraded security was lowered over the year declined to 3.2 in 2005 from 4.1 in 2004, while for upgraded securities, the average number of notches changed decreased slightly to 2.4 from the year-prior level of 2.6.
- Frequencies of transitions into the Caa or below rating category in 2005 declined significantly across all rating categories, and were also lower than their historical averages.
- In comparison to corporate ratings, structured finance ratings continue (as in past years) to experience less frequent but more severe rating changes, with a greater likelihood of being downgraded to Caa or below.
- The rating drift for US ABS turned positive for the first time since 1996 as the downgrade rate decreased from 8.5% in 2004 to 1.8% in 2005 and the upgrade rate increased from 2.0% to 3.0%. The steep decline in the number of manufactured housing (MH) downgrades was the major reason for the fall in downgrade activity for the US ABS sector as a whole.
- Securities backed by home equity loans (HEL) were the biggest contributor of ABS downgrades in 2005, although home equity ratings maintained a stability rate of over 96% and performance was in line with the previous year. The home equity sector also accounted for the greatest proportion of upgrades, followed by MH and three ABS asset classes that have performed well in the past that continued to do so in 2005, namely the auto, credit card, and student loan sectors.
- US CDOs continued their dramatic turnaround, recording a downgrade rate of 3.0% in 2005 compared to 5.6% in 2004 and 16.5% in 2003. US high-yield CBOs (HY CBOs) experienced even greater improvement, as the downgrade rate in the sector dropped to 1.0% and the upgrade rate increased to 4.8%. 82% of US CDO downgrades in 2005 occurred among resecuritization CDOs, which were hurt by some persistently weak segments of the ABS market.
- The US CMBS sector experienced a huge leap in upgrade activity in 2005 with the upgrade rate jumping to 16.4% in 2005 from 8.8% in 2004. The sector experienced a surge in defeasance in 2005 as borrowers replaced their loans with Treasury securities in order to take advantage of higher values in the commercial real estate market and refinance with significantly higher proceeds. This effectively boosted subordination levels for deals and resulted in higher numbers of upgrades. The frequency of downgrades declined to 3.5% in 2005 from 5.7% in the previous year.
- US RMBS also experienced high upgrade and low downgrade activity in 2005. The downgrade-to-upgrade ratio for 2005 was a striking 1:7.3, calculated from a downgrade rate of 0.9% and an upgrade rate of 6.8%. The mortgage pools backing these transactions continue to exhibit low losses and high prepayment rates leading to significant increases in tranche credit enhancement levels.
- Even with the improvements in the four major sectors of structured finance in the US, international structured finance outperformed the US in 2005. The European structured finance market benefited from the stabilization of CDO transactions and the strength of the RMBS sector.
- Rating stability in the global credit derivatives sector (made up mostly of structured notes and repackaged securities) was 91.3% in 2005, an increase over the rate of 90.1% in 2004, and an even bigger improvement over the historical average of 85.9% calculated from 1996-2004. The sector still sustained more downgrades than upgrades for the year, but the frequency of downgrades continued to trend downward and the frequency of upgrades upward.

---

3. The definition of this and other terms used in the report appear in the glossary in the Appendix.

---

---

# Table of Contents

---

|   | Page |
|---|------|
| <i>Summary Opinion</i> .....  | 1    |
| <i>The Global Distribution of Ratings and an Overview of Rating Transitions in 2005</i> ..... | 4    |
| Turnaround Continued in 2005 as Downgrade Rates Fell while Upgrade Rates Rose .....           | 5    |
| Comparisons to History and Corporate Ratings .....  | 7    |
| <i>Sector Specific Analysis of US Rating Transitions</i> .....                                | 9    |
| US ABS .....  | 9    |
| US ABS Backed by Home Equity Loans (HEL) .....  | 13   |
| US ABS excluding MH and HEL .....   | 14   |
| US CDOs .....   | 16   |
| US CDOs excluding HY CBOs .....   | 19   |
| US CMBS .....   | 20   |
| US RMBS .....   | 22   |
| <i>Regional Comparisons of Rating Transitions</i> .....                                       | 24   |
| European and US Rating Transition Rates .....   | 24   |
| Asia-Pacific and US Rating Transition Rates .....   | 25   |
| Non-US Americas and US Rating Transition Rates .....  | 27   |
| Rating Transitions in the Derivatives Sector .....  | 30   |
| <i>Summary and Outlook</i> .....  | 32   |
| <i>Appendix I: Description of Data Sample and Glossary</i> .....                              | 33   |
| Description of Data Sample .....  | 33   |
| Glossary .....  | 33   |
| <i>Appendix II: Treatment of Withdrawn Ratings (WR)</i> .....                                 | 36   |
| <i>Appendix III: Transition Matrices</i> .....  | 37   |
| <i>Related Research</i> .....   | 57   |

## The Global Distribution of Ratings and an Overview of Rating Transitions in 2005

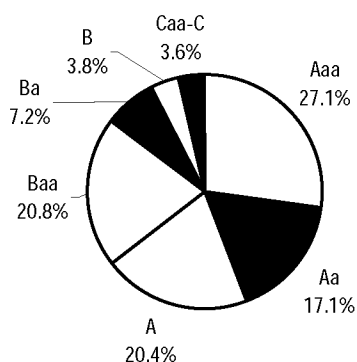
2005 was a banner year for the global structured finance market in that the performance of structured finance credits improved by almost all measures. Relative to 2004, the frequency and magnitude of downgrades decreased, upgrade rates increased, and transition rates from other rating categories to Caa or below declined dramatically. Moreover, these improvements were broad-based, affecting almost all sectors and regions.

In this section we describe the global distribution of ratings and analyze rating transitions for the entire structured finance market, combining the ABS, CDO, CMBS, and RMBS sectors across all regions, but excluding derivative securities such as structured notes, repackaged securities, and structured covered bonds. Detailed rating transitions data for each of the four sectors in the US are presented later in the report. Rating transitions in Europe, the Asia-Pacific region and the non-US Americas, as well as the global derivatives sector, are also analyzed later in the report.

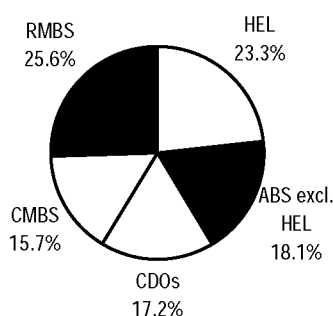
At the beginning of 2005, there were 27,610 global structured finance ratings outstanding from 8439 deals. (The construction of the data sample is explained in detail in the Appendix.) 85.4% of the outstanding ratings as of January 2005 were investment-grade and Aaa-rated securities, at 27.1% of the population, remained the most prevalent (Figure 2a). ABS remained the largest sector in structured finance, with a combined share of 41.4%, followed by RMBS (25.6%), CDOs (17.2%), and CMBS (15.7%) (Figure 2b). In terms of geographical region, approximately 81% of the outstanding ratings were from the US, 13.4% were from Europe, 4.7% from the Asia-Pacific region, and the remaining 1% from Canada and Latin America combined (Figure 2c).

**Figure 2 – Distribution of Outstanding Structured Finance Ratings on 1/1/2005**

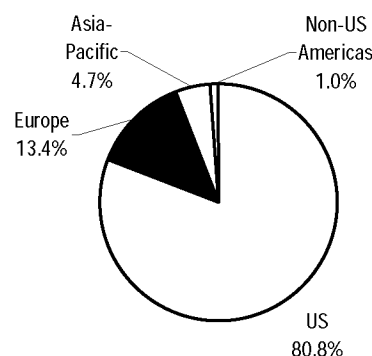
**Figure 2a – By Broad Rating**



**Figure 2b – By Sector**



**Figure 2c – By Region**



Over the course of 2005, 514 ratings from 258 deals were downgraded and 1641 ratings from 683 deals were upgraded.<sup>4</sup> Similar to 2004, ABS took the largest share of downgrades in 2005 at 35.4%. However, unlike 2004, when the manufactured housing (MH) sector accounted for most of the ABS downgrades, most of 2005 ABS downgrades occurred in the home equity (HEL) sector (Figure 3a). Downgrade activity in the CDO and CMBS sectors declined in 2005 on a year-over-year basis, but was also significant, contributing about 29% and 25%, respectively, to structured finance downgrades in 2005.

Upgrades were dominated by the CMBS and RMBS sectors, which together accounted for 67.4% of structured finance upgrades, even though they accounted for only 41.3% of all outstanding ratings (Figure 3b). However, in terms of absolute numbers, both the ABS and CDOs sectors experienced a substantial increase in upgrades in 2005 compared to 2004.

Almost all downgrades in 2005 were caused by weaker-than-anticipated performance of the underlying collateral, usually leading to higher-than-expected losses for the pool. Conversely, the vast majority of upgrades in 2005 resulted from strong collateral performance and increased credit enhancement levels from loan and note amortization. Only a small proportion of rating changes were triggered by changes in the rating of a related third party.

<sup>4</sup> In counting downgrades and upgrades, we only consider ratings at the beginning and the end of each year.



### Figure 3 - Distribution of Structured Finance Rating Changes in 2005

Figure 3a - Downgrades by Sector

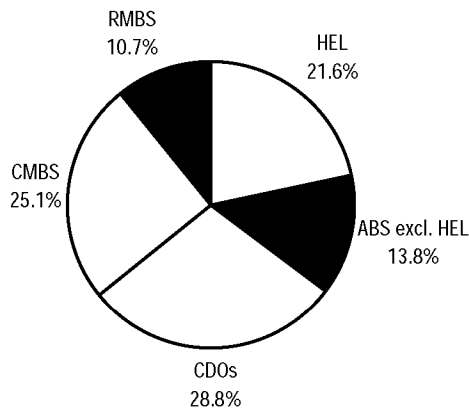
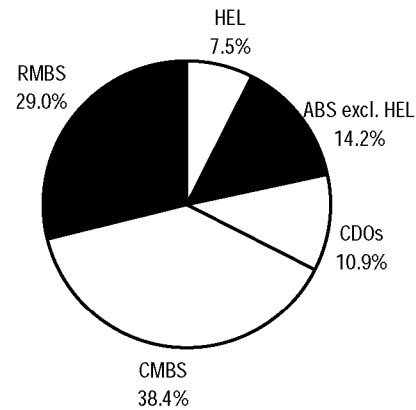


Figure 3b - Upgrades by Sector



#### *Turnaround Continued in 2005 as Downgrade Rates Fell while Upgrade Rates Rose*

The performance of global structured finance ratings continued to improve in 2005. The structured finance downgrade rate declined significantly, to 1.9% from 5.0% in the prior year, while the upgrade rate rose from 4.4% in 2004 to 6.2% in 2005 (Figure 4a). The magnitude of rating downgrades, measured by the number of notches changed in the course of the year per downgraded security, also decreased in 2005, by almost a notch, to 3.2 in 2005 from 4.1 in 2004 (Figure 4b). The magnitude of rating upgrades, similarly defined, remained roughly the same at 2.4 notches compared to 2.6 in 2004.

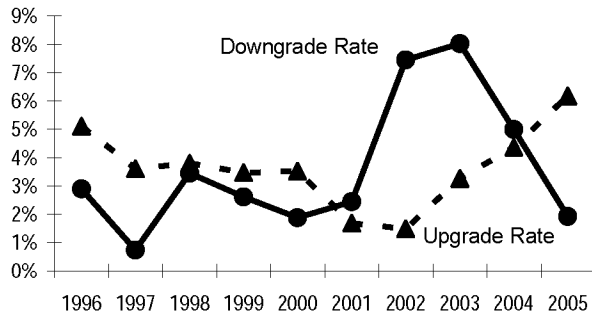
The decline in the downgrade rate was even more dramatic when weighted by the magnitude of downgrades, falling from 20.6% in 2004 to 6.1% in 2005 (Figure 4e). The weighted upgrade rate experienced a more modest increase, rising from 11.2% to 15.1%. As a result of these improvements, the rating drift – defined as the weighted upgrade rate minus the weighted downgrade rate – climbed into positive territory for the first time in five years (Figure 4c). Meanwhile, the rating volatility – defined as the sum of the weighted upgrade and weighted downgrade rate – declined to 21.2% from 31.8% in 2004.

The downgrade-to-upgrade ratio was roughly 1:3 in 2005 versus roughly 1:1 in 2004 (Figure 4e). The last time upgrades outnumbered downgrades was the year 2000.

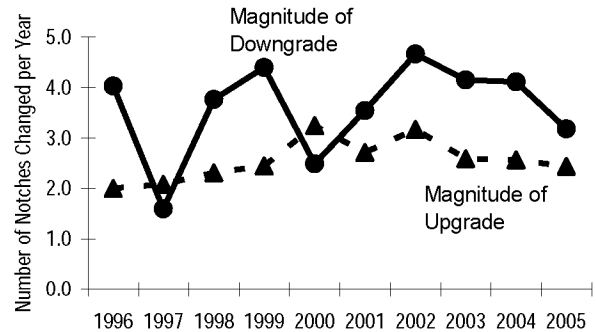
Figure 4d displays the cumulative downgrade rate to date and cumulative upgrade rate to date - defined as the percentage of securities whose rating before withdrawal or rating at the end of the study period was lower or higher than its original rating - for a range of vintages. By this measure, cumulative upgrades have outnumbered cumulative downgrades for securities issued between 1995 and 2004, but the ratio has varied widely by vintage. The 2000 vintage performed the worst in this group, with roughly two downgraded securities for every one upgraded. Securities issued in the US ABS, CDO, and CMBS sectors in that year experienced heightened downgrade rates. The more recent vintages have so far performed better, but there is still potential for more rating changes in the future.

## Figure 4 – Rating Transition Trends for Global Structured Finance

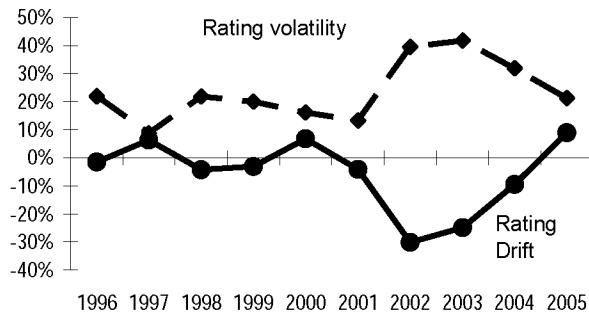
### Figure 4a – Downgrade Rates and Upgrade Rates



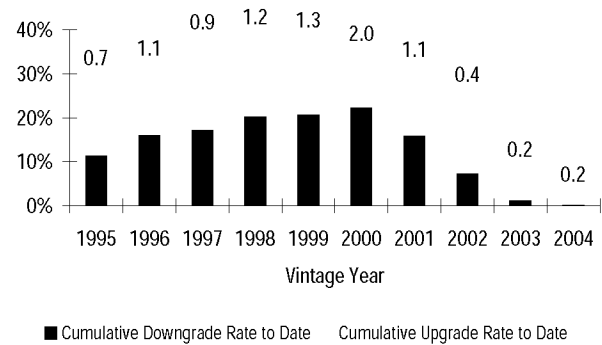
### Figure 4b – Magnitude of Downgrades and Upgrades



### Figure 4c – Rating Drift and Rating Volatility



### Figure 4d – Cumulative Downgrade and Upgrade Rates (with Downgrade-to-Upgrade Ratios)



|  | 2005   | 2004   | 1996-2005 | 1996-2004 |
|--|--------|--------|-----------|-----------|
| Downgrade Rate                           | 1.93%  | 5.01%  | 4.10%     | 4.72%     |
| Upgrade Rate                             | 6.17%  | 4.37%  | 3.92%     | 3.26%     |
| Downgrade/Upgrade ratio                  | 0.31   | 1.15   | 1.04      | 1.44      |
| Downgrade Rate (notch weighted)          | 6.15%  | 20.60% | 16.52%    | 19.51%    |
| Upgrade Rate (notch weighted)            | 15.06% | 11.21% | 9.92%     | 8.45%     |
| Downgrade/Upgrade ratio (notch weighted) | 0.41   | 1.84   | 1.66      | 2.30      |
| Rating Drift (notch weighted)            | 8.91%  | -9.39% | -6.60%    | -11.06%   |
| Rating Volatility (notch weighted)       | 21.21% | 31.81% | 26.44%    | 27.95%    |
| Stability Rate                           | 91.89% | 90.62% | 91.98%    | 92.01%    |
| Withdrawal Rate                          | 7.50%  | 11.41% | 8.46%     | 8.74%     |

## COMPARISONS TO HISTORY AND CORPORATE RATINGS

To put the turnaround in structured finance into context, we contrast the experience in 2005 with the historical experience over 1984 to 2004. The following observations were made about structured finance ratings in our previous transitions studies:

- Prior to 2005, structured finance securities experienced more downgrades than upgrades with a downgrade-to-upgrade ratio of 1.4 (Figure 5). This is similar to the corporate experience where the ratio was 1.6 over 1984 to 2004. However, both downgrade and upgrade rates in corporate finance were significantly higher than they were in structured finance.
- The magnitude of rating changes has been large in structured finance, particularly for downgrades, where the average decline in ratings over the year was 3.9 notches. For upgrades, the average number of notches increased was 2.5. The average magnitude of corporate rating changes was more than 2 notches smaller for downgrades and 1 notch smaller for upgrades.
- Historically, structured finance ratings have had higher downgrade rates to Caa or below than corporate ratings (except for the single-B rating category where they are roughly equal), and the difference has been particularly large for investment-grade ratings (Figure 6).
- Downgrade and upgrade rates in structured finance have varied greatly by asset type in the US. In particular, the US CMBS and RMBS sectors have experienced lower downgrade rates and higher upgrade rates than the US ABS and CDO sectors.

In comparison, we found that in 2005:

- In contrast to historical experience, structured finance upgrades outnumbered downgrades in 2005 by a ratio of roughly three to one. The corporate downgrade-to-upgrade ratio also declined, but by a smaller amount. Rates of downgrades and upgrades in 2005 were still higher in the corporate sector than they were in the structured sector.
- The size of structured finance rating downgrades decreased to 3.2 notches, while the size of rating upgrades was roughly the same as its historical average. They remain larger than the size of corporate rating downgrades and upgrades.
- Transition rates to Caa or below dropped significantly in 2005 across all rating categories compared to the historical average for structured finance and were also lower than the historical average for corporate finance. However, they were still larger than corporate transition rates to Caa or below in 2005.
- In general, US CMBS and RMBS continued to outperform ABS and CDOs in 2005, although performance in the ABS and CDO sectors improved greatly and the downgrade rate for CMBS in 2005 was actually higher than that for ABS.

**Figure 5 – Global Structured Finance and Corporate Annual Rating Transition Statistics**

|  | Structured<br>Finance 2005 | Structured Finance<br>1984-2004 | Corporate<br>Finance 2005 | Corporate Finance<br>1984-2004 |
|--|----------------------------|---------------------------------|---------------------------|--------------------------------|
| Downgrade Rate                           | 1.93%                      | 4.74%                           | 8.28%                     | 13.85%                         |
| Upgrade Rate                             | 6.17%                      | 3.49%                           | 13.84%                    | 8.51%                          |
| Downgrade/Upgrade ratio                  | 0.31                       | 1.36                            | 0.60                      | 1.63                           |
| Downgrade Rate (notch weighted)          | 6.15%                      | 18.54%                          | 13.92%                    | 25.24%                         |
| Upgrade Rate (notch weighted)            | 15.06%                     | 8.56%                           | 19.67%                    | 13.18%                         |
| Downgrade/Upgrade ratio (notch weighted) | 0.41                       | 2.17                            | 0.71                      | 1.91                           |
| Rating Drift (notch weighted)            | 8.91%                      | -9.98%                          | 5.75%                     | -12.07%                        |
| Rating Volatility (notch weighted)       | 21.21%                     | 27.11%                          | 33.58%                    | 38.42%                         |
| Stability Rate                           | 91.9%                      | 91.76%                          | 77.88%                    | 77.64%                         |
| Withdrawal Rate                          | 7.5%                       | 8.31%                           | 6.60%                     | 5.80%                          |
| Magnitude of Downgrades (notches)        | 3.2                        | 3.9                             | 1.7                       | 1.8                            |
| Magnitude of Upgrades (notches)          | 2.4                        | 2.5                             | 1.4                       | 1.5                            |

**Figure 6 – Global Structured Finance Annual Rating Transition Matrices, Compared with Global Corporate Annual Rating Transition Matrices<sup>5</sup>**

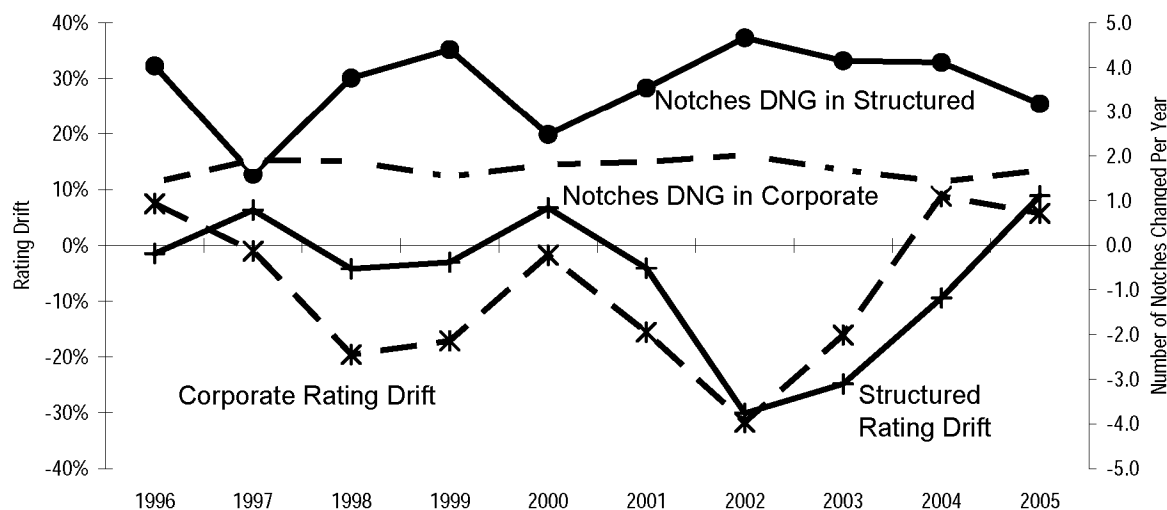
| Structured Finance in 2005 Ratings to:            |        |        |        |        |        |        |              |
|---|--------|--------|--------|--------|--------|--------|--------------|
| Ratings from:                                     | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa   | 99.70% | 0.24%  | 0.04%  |        | 0.01%  |        |              |
| Aa  | 8.25%  | 90.61% | 0.83%  | 0.18%  | 0.07%  | 0.04%  | 0.02%        |
| A   | 2.03%  | 5.57%  | 91.30% | 0.76%  | 0.18%  | 0.04%  | 0.13%        |
| Baa   | 0.45%  | 0.57%  | 4.23%  | 93.07% | 1.02%  | 0.39%  | 0.27%        |
| Ba  | 0.10%  | 0.10%  | 0.21%  | 3.44%  | 92.66% | 2.52%  | 0.98%        |
| B   | 0.10%  |        | 0.20%  |        | 2.66%  | 89.76% | 7.29%        |
| Caa or below                                      |        |        |        |        | 0.10%  | 0.10%  | 99.79%       |
| Structured Finance: 1984-2004 average             |        |        |        |        |        |        |              |
| Ratings from:                                     | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa   | 98.73% | 0.89%  | 0.21%  | 0.08%  | 0.02%  | 0.02%  | 0.03%        |
| Aa  | 4.88%  | 91.64% | 2.37%  | 0.69%  | 0.17%  | 0.10%  | 0.14%        |
| A   | 1.00%  | 3.11%  | 92.38% | 2.34%  | 0.67%  | 0.25%  | 0.25%        |
| Baa   | 0.36%  | 0.53%  | 2.44%  | 90.47% | 3.53%  | 1.35%  | 1.32%        |
| Ba  | 0.10%  | 0.10%  | 0.57%  | 3.28%  | 86.37% | 3.85%  | 5.74%        |
| B   | 0.05%  |        | 0.08%  | 0.51%  | 1.98%  | 85.91% | 11.46%       |
| Caa or below                                      |        |        |        |        | 0.05%  | 0.57%  | 99.38%       |
| Corporate Finance in 2005 <sup>6</sup>            |        |        |        |        |        |        |              |
| Ratings from:                                     | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa   | 95.99% | 3.51%  | 0.50%  |        |        |        |              |
| Aa  | 0.25%  | 97.51% | 1.99%  | 0.12%  | 0.12%  |        |              |
| A   | 0.15%  | 1.92%  | 94.16% | 3.70%  | 0.07%  |        |              |
| Baa   |        | 0.25%  | 6.57%  | 88.79% | 3.37%  | 0.84%  | 0.17%        |
| Ba  |        |        | 0.71%  | 9.61%  | 81.67% | 7.47%  | 0.53%        |
| B   |        |        | 0.13%  |        | 8.68%  | 85.35% | 5.83%        |
| Caa or below                                      |        |        | 0.37%  | 0.74%  | 1.49%  | 22.72% | 74.67%       |
| Corporate Finance: 1984-2004 average <sup>6</sup> |        |        |        |        |        |        |              |
| Ratings from:                                     | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa   | 92.56% | 7.14%  | 0.27%  |        | 0.03%  |        |              |
| Aa  | 0.94%  | 91.15% | 7.60%  | 0.23%  | 0.06%  | 0.01%  | 0.02%        |
| A   | 0.05%  | 2.62%  | 91.11% | 5.43%  | 0.57%  | 0.18%  | 0.04%        |
| Baa   | 0.05%  | 0.26%  | 5.17%  | 88.25% | 4.80%  | 0.99%  | 0.48%        |
| Ba  | 0.01%  | 0.04%  | 0.55%  | 5.84%  | 82.26% | 9.09%  | 2.22%        |
| B   | 0.01%  | 0.06%  | 0.23%  | 0.51%  | 5.62%  | 81.66% | 11.91%       |
| Caa or below                                      |        |        |        | 0.10%  | 0.65%  | 6.85%  | 92.40%       |

5. Rating transition rates are adjusted for withdrawn ratings. We deduct half of the withdrawn ratings from the total number of ratings outstanding at the beginning of each year. The frequency of ratings remaining unchanged, also called the rating stability rate and located in the diagonal entries of the matrix, is calculated as one minus the sum of the transition rates into different rating categories. Rating transition rates unadjusted for withdrawals are provided in the Appendix.

6. Corporate defaults are included in the Caa or below category.

The rating drift for structured finance and corporate finance have generally trended upward and downward at the same time over the last ten years, but this pattern was broken in 2005 (Figure 7). The rating drift for structured finance jumped upward in 2005 at the same time that the drift for corporate finance declined from 8.8% to 5.8%. While the downgrade and upgrade rates in corporate finance were roughly flat in 2005 compared to 2004, the magnitude of corporate downgrades increased and the magnitude of upgrades decreased causing the rating drift to decline. Although the average size of corporate rating downgrades increased from 1.4 notches to 1.7 in 2005, it is still substantially lower than the magnitude of structured finance downgrades.

**Figure 7 – Comparisons of Ratings Drift and Average Number of Notches Changed per Downgrade per Year between Structured Finance and Corporate Finance**



## Sector Specific Analysis of US Rating Transitions

### US ABS

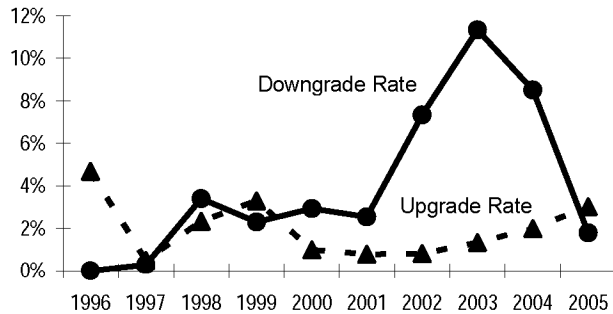
Out of a total universe of 10,075 US ABS ratings from 2737 deals at the beginning of 2005, 175 ratings from 86 deals were downgraded and 294 ratings from 175 deals were upgraded in 2005. The downgrade rate in the US ABS sector declined dramatically to 1.8% relative to the year-prior rate of 8.5%, while the upgrade rate rose to 3.0% from 2.0% in 2004 (Figure 8a).

The magnitude of rating downgrades also decreased from 5.1 in 2004 to 3.5 in 2005, while the magnitude of rating upgrades edged down slightly to 2.5 from 3.0 (Figure 8b). The US ABS downgrade rate, when weighted by the magnitude of downgrades, fell even more precipitously from 43.5% in 2004 to 6.3% in 2005, while the weighted upgrade rate increased to 7.7% from 6.0%. As a result, for the first time since 1996, the rating drift climbed above zero to 1.4% from last year's level of -37.5%, while the rating volatility for 2005 at 14.0% was less than a third of what it was (49.5%) in 2004 (Figure 8c).

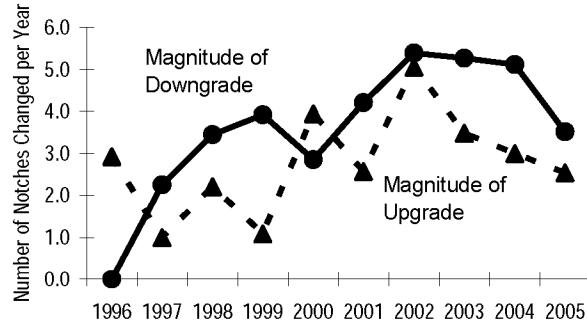
US ABS issued between 1995 and 2002 have experienced a ratio of cumulative downgrades to cumulative upgrades of almost 2 (Figure 8d). This has been primarily due to the poor performance of a few asset types within ABS.

## Figure 8 – Rating Transition Trends for US ABS

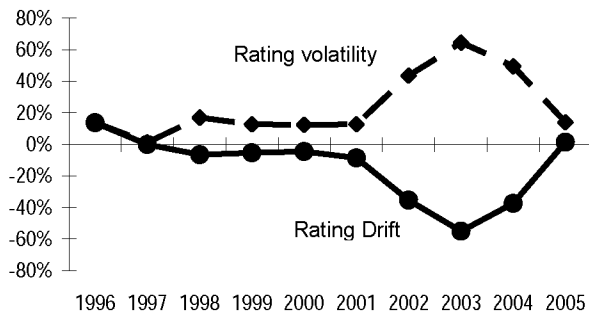
### Figure 8a - Downgrade Rates and Upgrade Rates



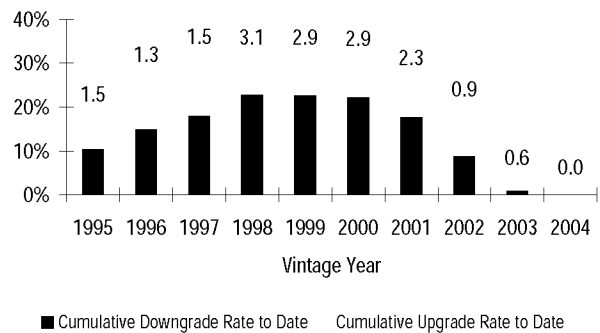
### Figure 8b – Magnitude of Downgrades and Upgrades



### Figure 8c – Rating Drift and Rating Volatility



### Figure 8d – Cumulative Downgrade and Upgrade Rates (with Downgrade-to-Upgrade Ratios)



### Figure 8e – Annual Rating Transition Statistics

|  | 2005   | 2004    | 1996-2005 | 1996-2004 |
|--|--------|---------|-----------|-----------|
| Downgrade Rate                           | 1.80%  | 8.51%   | 5.05%     | 6.04%     |
| Upgrade Rate                             | 3.02%  | 1.99%   | 1.94%     | 1.61%     |
| Downgrade/Upgrade ratio                  | 0.60   | 4.26    | 2.59      | 3.73      |
| Downgrade Rate (notch weighted)          | 6.32%  | 43.50%  | 24.39%    | 29.88%    |
| Upgrade Rate (notch weighted)            | 7.67%  | 5.98%   | 5.28%     | 4.55%     |
| Downgrade/Upgrade ratio (notch weighted) | 0.82   | 7.27    | 4.60      | 6.56      |
| Rating Drift (notch weighted)            | 1.36%  | -37.51% | -19.11%   | -25.33%   |
| Rating Volatility (notch weighted)       | 13.99% | 49.48%  | 29.66%    | 34.43%    |
| Stability Rate                           | 95.18% | 89.50%  | 93.01%    | 92.35%    |
| Withdrawal Rate                          | 6.72%  | 10.89%  | 8.33%     | 8.82%     |

Unlike the past three years, when securities backed by manufactured housing loans (MH) accounted for the greatest number of downgrades, the home equity sector was the major contributor of both downgrades and upgrades in 2005 (Figure 9). The decline in downgrades among MH ABS was the single most important factor for the improved performance of US ABS in 2005.

**Figure 9 – Downgrade Rates and Upgrade Rates in 2005 by Asset Class in US ABS**

| ABS Asset type  | Ratings Outstanding on 1/1/2005 | Downgrades in 2005 | Upgrades in 2005 | Withdrawals in 2005 | Downgrade Rate in 2005 | Upgrade Rate in 2005 | % of Total Downgrades | % of Total Upgrades |
|-----------------|---------------------------------|--------------------|------------------|---------------------|------------------------|----------------------|-----------------------|---------------------|
| MH              | 693                             | 5                  | 57               | 20                  | 0.7%                   | 8.3%                 | 2.9%                  | 19.4%               |
| HEL             | 6445                            | 111                | 123              | 289                 | 1.8%                   | 2.0%                 | 63.4%                 | 41.8%               |
| Autos           | 391                             | 0                  | 46               | 53                  | 0.0%                   | 12.6%                | 0.0%                  | 15.6%               |
| Credit Cards    | 863                             | 0                  | 32               | 188                 | 0.0%                   | 4.2%                 | 0.0%                  | 10.9%               |
| Student Loans   | 444                             | 0                  | 23               | 10                  | 0.0%                   | 5.2%                 | 0.0%                  | 7.8%                |
| Aircraft Lease  | 76                              | 11                 | 0                | 3                   | 14.8%                  | 0.0%                 | 6.3%                  | 0.0%                |
| Equip Lease     | 194                             | 5                  | 8                | 21                  | 2.7%                   | 4.4%                 | 2.9%                  | 2.7%                |
| Franchise Loans | 144                             | 21                 | 0                | 7                   | 14.9%                  | 0.0%                 | 12.0%                 | 0.0%                |
| Tobacco         | 99                              | 0                  | 0                | 9                   | 0.0%                   | 0.0%                 | 0.0%                  | 0.0%                |
| Other           | 726                             | 22                 | 5                | 77                  | 3.2%                   | 0.7%                 | 12.6%                 | 1.7%                |

The turnaround in the MH sector is starkly displayed in Figure 10. In 2005, the MH downgrade rate fell precipitously from a whopping 38.0% the previous year to a low 0.7%, and the upgrade rate rose from 8.3% from 0.1%. The MH sector has been plagued by poor performance caused by a confluence of multiple negative trends,<sup>7</sup> but there are indications that performance has been stabilizing. All the upgrades in the MH sector in 2005 were related to tranches from manufactured housing securitizations issued by Vanderbilt Mortgage and Finance (Vanderbilt). 63% of the Vanderbilt upgrades affected the guaranteed certificates and were based on the upgrade of Clayton Homes, Inc., Vanderbilt's parent, while the remaining 37% were caused by a build-up in credit enhancement.

**Figure 10 – US MH Annual Transition Statistics**

|  | 2005   | 2004     | 1996-2005 | 1996-2004 |
|--|--------|----------|-----------|-----------|
| Downgrade Rate                           | 0.73%  | 37.96%   | 15.62%    | 17.86%    |
| Upgrade Rate                             | 8.35%  | 0.14%    | 2.74%     | 1.89%     |
| Downgrade/Upgrade ratio                  | 0.09   | 264.00   | 5.70      | 9.42      |
| Downgrade Rate (notch weighted)          | 1.46%  | 262.69%  | 88.29%    | 101.32%   |
| Upgrade Rate (notch weighted)            | 14.93% | 1.44%    | 5.88%     | 4.52%     |
| Downgrade/Upgrade ratio (notch weighted) | 0.10   | 182.70   | 14.96     | 22.32     |
| Rating Drift (notch weighted)            | 13.47% | -261.25% | -82.41%   | -96.79%   |
| Rating Volatility (notch weighted)       | 16.40% | 264.13%  | 94.18%    | 105.84%   |
| Stability Rate                           | 90.92% | 61.90%   | 81.64%    | 80.25%    |
| Withdrawal Rate                          | 2.89%  | 2.70%    | 3.71%     | 3.83%     |

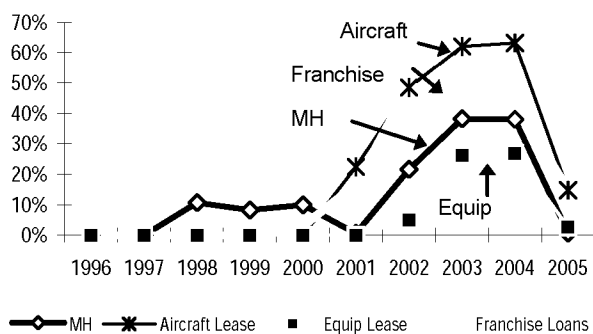
Deals backed by franchise loans, aircraft leases, equipment leases, and tobacco settlement payments, which have also been significant contributors of downgrades in the past, also saw large declines in their downgrade rates in 2005. ABS securities backed by traditional consumer credit, such as auto loans, credit card receivables, and student loans continued to perform well.

7. See Moody's Structured Finance Special Report, "2005 Review and 2006 Outlook: Manufactured Housing Asset Backed Securities The Recovery Continues," January 24, 2006.

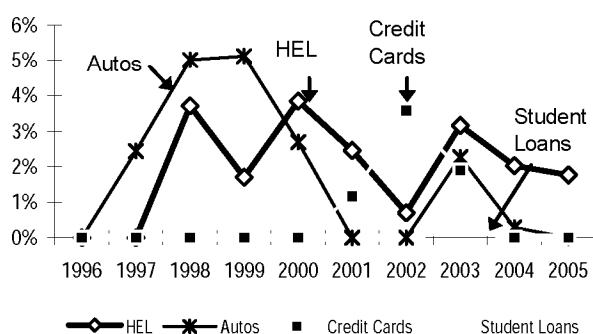
The diverse performance of different asset types in ABS can be seen in Figure 11, which shows the annual downgrade and upgrade rates of select asset classes over time. Securities backed by MH, aircraft leases, equipment leases, and franchise loans experienced very high downgrade rates over the 2001 to 2004 period, only declining significantly within the last year (Figure 11a). Most of these sectors have also experienced low upgrade rates. In contrast, downgrade rates for securities backed by home equity loans, auto loans, credit cards, and student loans have been below 6%, often by a substantial amount, for every year of the last decade (Figure 11b). While upgrade rates have also been low for these sectors, they have been on an upward trend for the last two years.

**Figure 11 – Annual Downgrade and Upgrade Rates for Select US ABS Asset Classes**

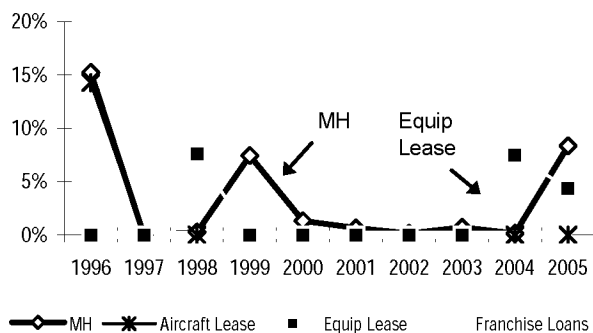
**Figure 11a - Annual Downgrade Rates**



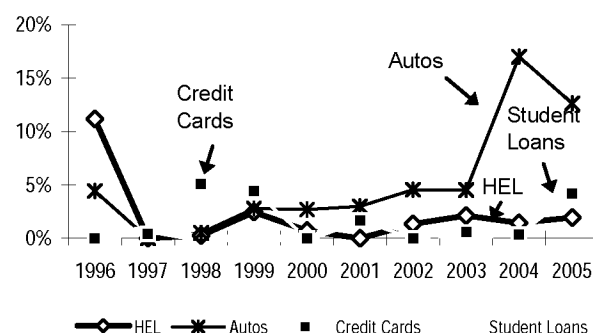
**Figure 11b - Annual Downgrade Rates**



**Figure 11c - Annual Upgrade Rates**



**Figure 11d - Annual Upgrade Rates**



Because of its large size, the home equity (HEL) sector will be analyzed separately in the following section. US ABS excluding HEL securities and MH securities will also be discussed.



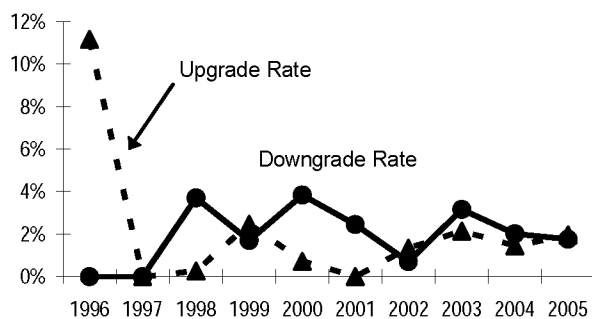
## US ABS BACKED BY HOME EQUITY LOANS (HEL)

Performance in the US home equity sector in 2005 was in line with that of 2004. Out of a total universe of 6,445 US HEL ratings from 1196 deals at the beginning of 2005, 111 ratings from 57 deals were downgraded and 123 ratings from 70 deals were upgraded. The downgrade rate for US HEL declined slightly to 1.8% from 2.0% and the upgrade rate increased slightly to 2.0% from 1.5% (Figure 12a).

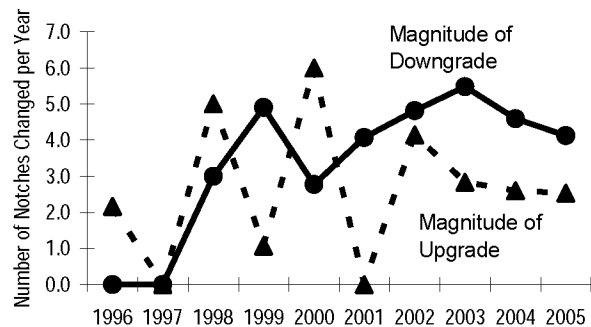
All HEL downgrades in 2005 were related to poor collateral performance and the resulting erosion in overcollateralization. 98% of the upgrades were caused primarily by a build-up of credit enhancement levels, often from rapid prepayments, and sometimes combined with the strong performance of the loans, which have benefited from the strong home price appreciation that has occurred in most major US housing markets over the last few years.<sup>8</sup>

**Figure 12 – Rating Transition Trends for US HEL**

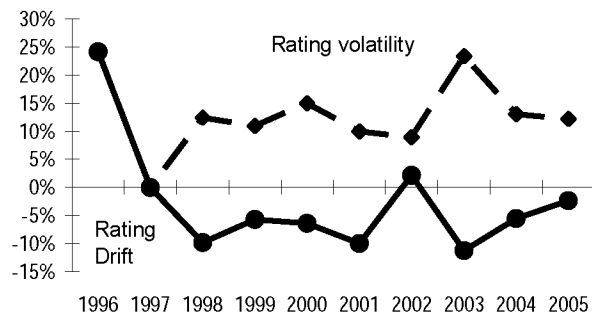
**Figure 12a - Downgrade Rates and Upgrade Rates**



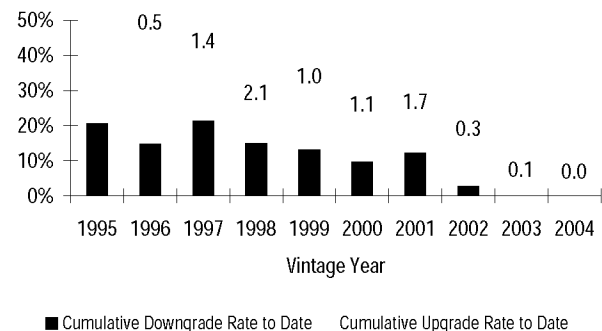
**Figure 12b – Magnitude of Downgrades and Upgrades**



**Figure 12c – Rating Drift and Rating Volatility**



**Figure 12d – Cumulative Downgrade and Upgrade Rates (with Downgrade-to-Upgrade Ratios)**



**Figure 12e - Annual Rating Transition Statistics**

|  | 2005   | 2004   | 1996-2005 | 1996-2004 |
|--|--------|--------|-----------|-----------|
| Downgrade Rate                           | 1.76%  | 2.02%  | 2.07%     | 2.25%     |
| Upgrade Rate                             | 1.95%  | 1.45%  | 1.65%     | 1.48%     |
| Downgrade/Upgrade ratio                  | 0.90   | 1.40   | 1.26      | 1.53      |
| Downgrade Rate (notch weighted)          | 7.27%  | 9.30%  | 9.10%     | 10.16%    |
| Upgrade Rate (notch weighted)            | 4.95%  | 3.78%  | 4.47%     | 4.19%     |
| Downgrade/Upgrade ratio (notch weighted) | 1.47   | 2.46   | 2.03      | 2.43      |
| Rating Drift (notch weighted)            | -2.32% | -5.53% | -4.63%    | -5.98%    |
| Rating Volatility (notch weighted)       | 12.22% | 13.08% | 13.57%    | 14.35%    |
| Stability Rate                           | 96.29% | 96.52% | 96.27%    | 96.27%    |
| Withdrawal Rate                          | 4.48%  | 7.81%  | 5.24%     | 5.68%     |

8. See "2005 Review & 2006 Outlook: Home Equity ABS After Another Record Year, Will 2006 Offer Less," Moody's Structured Finance Special Report, January 24, 2006

The magnitude of downgrades experienced a small decrease, from 4.6 to 4.1 in 2005, while the magnitude of upgrades was roughly flat at 2.5 in 2005 (Figure 12b). The rating drift continued to stay negative in 2005, drifting upward to -2.3% from -5.5%, while the rating volatility decreased slightly from 13.1% to 12.2% (Figure 12c).

The average cumulative downgrade to cumulative upgrade ratio for all HEL securities issued between 1995 and 2004 is exactly one, but performance has varied greatly by individual vintage (Figure 12d). The 1997 vintage has experienced the highest cumulative downgrade rate so far among these vintages and the 1998 vintage has also under-performed. This is partially due to the poor performance of subprime mortgage pools securitized in 1997 and 1998 by currently inactive lenders, primarily as a result of poor underwriting and inaccurate appraisals.<sup>9</sup> In contrast, the 2002 vintage has experienced a high upgrade rate relative to its age because of high credit enhancement levels relative to the projected pipeline losses.

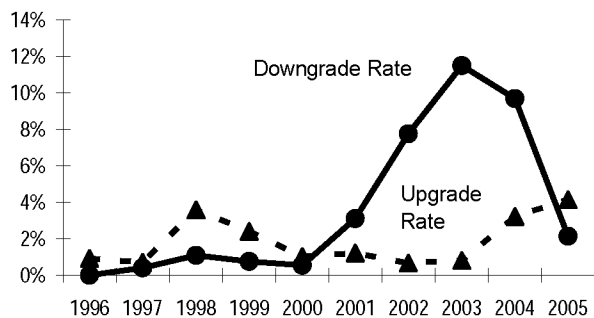
### US ABS EXCLUDING MH AND HEL

The US ABS sector, outside of MH and HEL, continued improving in 2005. Out of a total universe of 2,937 ratings from 1371 deals at the beginning of 2005, 59 ratings from 26 deals were downgraded and 114 ratings from 80 deals were upgraded in 2005. The downgrade rate decreased to 2.1% from 9.7% in 2004, while the upgrade rate increased to 4.1% from 3.2% in 2004 (Figure 13a). The downgrade rate in this sector was comparable to the 1.8% rate in the US HEL sector.

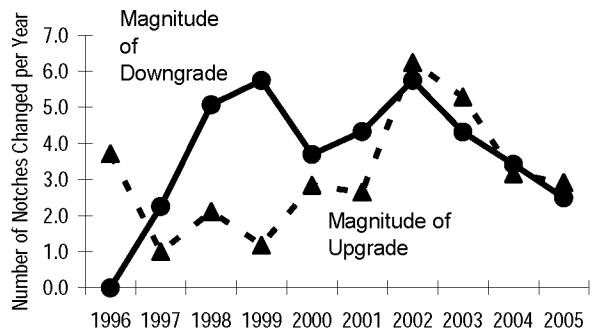
The magnitude of downgrades continued to trend downward from a peak of 5.8 in 2002 to 2.5 in 2005 (Figure 13b). The same was true of the magnitude of upgrades, down to 2.9 in 2005 from a high of 6.3, also in 2002. The rating drift turned positive in 2005 at 6.8%, a first in five years, while rating volatility decreased significantly to 17.4% from 43.4% in 2004 (Figure 13c).

**Figure 13 – Rating Transition Trends for US ABS (excl. MH and HEL)**

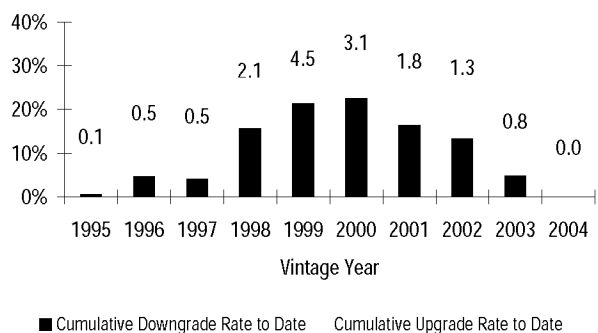
**Figure 13a - Downgrade Rates and Upgrade Rates**



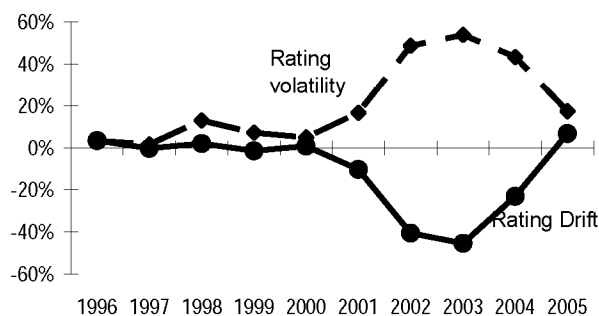
**Figure 13b – Magnitude of Downgrades and Upgrades**



**Figure 13d – Cumulative Downgrade and Upgrade Rates (with Downgrade-to-Upgrade Ratios)**



**Figure 13c – Rating Drift and Rating Volatility**



9. See "ContiMortgage 1997-1, 1997-2 and 1997-3: What Prompted the Rating Downgrades," Moody's Structured Finance Rating Update, November 10, 2000 and "Home Equity Index Update, First Quarter 2002 Data: Home Equity Chargeoffs Accelerate, Delinquencies Remain High," Moody's Structured Finance Credit Index Report, September 10, 2002.

| <b>Figure 13e – Annual Rating Transition Statistics</b> |             |             |                  |                  |
|---|-------------|-------------|------------------|------------------|
|   | <b>2005</b> | <b>2004</b> | <b>1996-2005</b> | <b>1996-2004</b> |
| Downgrade Rate  | 2.14%       | 9.70%       | 4.82%            | 5.27%            |
| Upgrade Rate  | 4.14%       | 3.22%       | 1.99%            | 1.62%            |
| Downgrade/Upgrade ratio                                 | 0.52        | 3.01        | 2.40             | 3.21             |
| Downgrade Rate (notch weighted)                         | 5.34%       | 33.20%      | 20.47%           | 23.02%           |
| Upgrade Rate (notch weighted)                           | 12.10%      | 10.19%      | 5.85%            | 4.80%            |
| Downgrade/Upgrade ratio (notch weighted)                | 0.44        | 3.26        | 3.49             | 4.79             |
| Rating Drift (notch weighted)                           | 6.76%       | -23.00%     | -14.62%          | -18.23%          |
| Rating Volatility (notch weighted)                      | 17.44%      | 43.39%      | 26.32%           | 27.82%           |
| Stability Rate  | 93.72%      | 87.07%      | 93.19%           | 93.10%           |
| Withdrawal Rate   | 12.53%      | 16.88%      | 12.20%           | 12.15%           |

Asset classes that have experienced problems in the past continued to be the major contributors of downgrades in 2005 for ABS excluding MH and HEL. Securities backed by franchise loans accounted for 35.6% of 2005 downgrades, small business loans accounted for 20.3%, aircraft lease accounted for 18.6% and equipment leases accounted for 8.5%, for a total of 83.1% of downgrades. Not only were the same asset classes present, but many of the names were also familiar – AMRESKO Commercial Finance and Falcon Financial, LLC, for franchise loans, DVI Financial Services, Inc. for equipment leases, and First International Bank for small business loans. In fact 94% of the securities downgraded in 2005 in these four asset types had been downgraded prior to 2005. The further downgrades were caused by continued deterioration in the underlying collateral.

ABS asset classes that have performed well in the past, also continued to do so in 2005. Transactions backed by auto loans, credit card receivables, and student loans experienced no downgrades in 2005 and accounted for 40.4%, 28.1%, and 20.2% of the upgrades respectively among ABS excluding MH and HEL. The major reason for the upgrades in the auto sector was a build-up of credit enhancement. In addition, some of the auto loan pools were performing in line with, or slightly better than, Moody's initial expectations.<sup>10</sup> 72% of the credit card ABS upgrades affected securities issued from the Providian Gateway Master Trust and the related Providian owner trusts. These upgrades were caused by the upgrade of the ratings of Providian Financial Corporation and its subsidiary Providian National Bank, which was taken in anticipation of the acquisition of Providian by Washington Mutual, Inc.<sup>11</sup> All but one of the student loan ABS upgrades were from Sallie Mae securitizations that were upgraded due to the strong performance of the underlying collateral.<sup>12</sup>

ABS securities excluding MH and HEL issued between 1998 and 2002 have experienced significantly higher cumulative downgrade rates than cumulative upgrade rates (Figure 13d). The troubled asset classes mentioned earlier are the major contributors of downgrades for these vintages, as well as tobacco settlement bonds and transactions backed by health care receivables. There has been an uptick in upgrades starting from the 2002 vintage, mostly occurring within the auto and credit card ABS sectors.

10. See the related Moody's press release, "Moody's upgrades 48 tranches and confirms 1 tranche from 34 auto loan-backed securitizations," September 26, 2005.

11. See the related Moody's press release, "Moody's upgrades 23 classes of securities issued by Providian's credit card trusts," October 21, 2005.

12. See the related Moody's press release, "Moody's upgrades twenty two subordinated classes of Sallie Mae's student loan securitizations," September 6, 2005.

## US CDOs

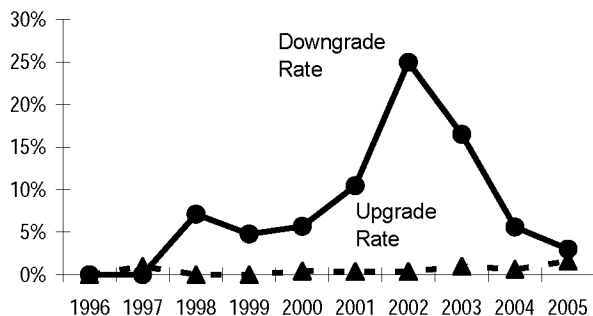
The US CDO sector continued its dramatic turnaround in 2005.<sup>13</sup> Out of a total universe of 3,084 US CDO ratings outstanding from 1057 deals at the beginning of the year, 89 ratings from 44 deals were downgraded and 47 ratings from 30 deals were upgraded. This is the first year of double-digit rather than triple-digit downgrades in the US CDO sector since 2000, and as a result the downgrade rate fell to 3.0% from 5.6% in 2004 and 16.5% in 2003 (Figure 14a). The upgrade rate increased to 1.6% from 0.6% last year.

Both the magnitude of rating downgrades and upgrades grew in 2005, from 3.9 to 4.5 for downgrades and from 2.1 to 3.1 for upgrades (Figure 14b). Still, this was not enough to offset the decrease in downgrade activity, and as a result, the rating drift ascended to -8.7% from -20.8% in 2004, and rating volatility declined to 18.6% from 23.5% (Figure 14c).

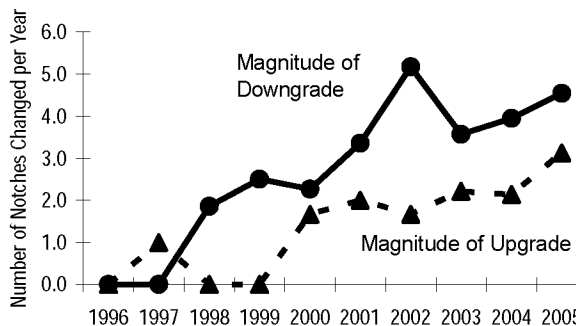
The past distress experienced by the US CDO sector is clearly exhibited in the Figure 14d. Close to 40% of CDO securities issued between 1996 and 2001 have ended up with lower ratings than at issuance. The reasons for this volatility have been discussed in various reports<sup>14</sup> and include the adverse corporate credit environment over the 2000-2002 period, adverse selection of collateral assets, and the behavior of some collateral managers.

**Figure 14 – Rating Transition Trends for US CDOs**

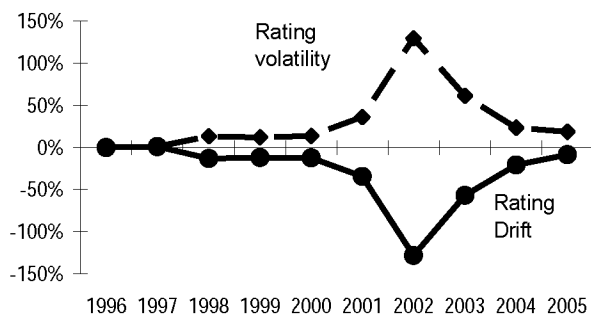
**Figure 14a - Downgrade Rates and Upgrade Rates**



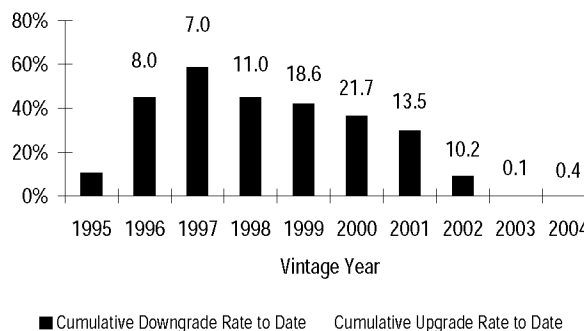
**Figure 14b – Magnitude of Downgrades and Upgrades**



**Figure 14c – Rating Drift and Rating Volatility**



**Figure 14d – Cumulative Downgrade and Upgrade Rates (with Downgrade-to-Upgrade Ratios)**



13. More detailed analysis of CDO ratings migration statistics in 2005 will be published in a separate study. See also "Credit Migration of CDO Notes, 1996-2004, for US and European Transactions," Moody's Structured Finance Special Report, March 10, 2005.

14. See, for example, "Default & Loss Rates of U.S. CDOs: 1993-2003," Moody's Special Comment, March 2005, and "Structural Features Aimed at Enhancing CDO Ratings Stability: An Overview," Moody's Structured Finance Special Report, July 11, 2002.

|  | 2005   | 2004    | 1996-2005 | 1996-2004 |
|--|--------|---------|-----------|-----------|
| Downgrade Rate                           | 3.01%  | 5.62%   | 9.74%     | 12.14%    |
| Upgrade Rate                             | 1.59%  | 0.62%   | 0.84%     | 0.57%     |
| Downgrade/Upgrade ratio                  | 1.89   | 9.00    | 11.76     | 21.42     |
| Downgrade Rate (notch weighted)          | 13.65% | 22.17%  | 40.23%    | 49.70%    |
| Upgrade Rate (notch weighted)            | 4.97%  | 1.33%   | 2.16%     | 1.16%     |
| Downgrade/Upgrade ratio (notch weighted) | 2.75   | 16.66   | 18.82     | 42.94     |
| Rating Drift (notch weighted)            | -8.68% | -20.84% | -38.08%   | -48.55%   |
| Rating Volatility (notch weighted)       | 18.61% | 23.50%  | 42.39%    | 50.86%    |
| Stability Rate                           | 95.41% | 93.76%  | 89.42%    | 87.29%    |
| Withdrawal Rate                          | 8.01%  | 5.19%   | 5.55%     | 4.68%     |

US high-yield collateralized bond obligations (HY CBOs) were especially hard hit by the high default rates and low recovery rates of speculative-grade corporate bonds during 2000 to 2002.<sup>15</sup> However, performance has improved significantly since 2002. The US HY CBO downgrade rate in 2005 was 1.0% compared to the historical average of 23.1%, and the upgrade rate was 4.8% versus 0.6% historically (Figure 15). The rating drift in 2005 was positive for the first time ever.

|  | 2005   | 2004    | 1996-2005 | 1996-2004 |
|--|--------|---------|-----------|-----------|
| Downgrade Rate                           | 1.00%  | 7.40%   | 19.40%    | 23.06%    |
| Upgrade Rate                             | 4.78%  | 2.28%   | 1.31%     | 0.63%     |
| Downgrade/Upgrade ratio                  | 0.21   | 3.25    | 15.00     | 37.19     |
| Downgrade Rate (notch weighted)          | 2.39%  | 17.08%  | 80.23%    | 95.72%    |
| Upgrade Rate (notch weighted)            | 17.11% | 5.12%   | 3.92%     | 1.29%     |
| Downgrade/Upgrade ratio (notch weighted) | 0.14   | 3.33    | 20.86     | 74.85     |
| Rating Drift (notch weighted)            | 14.73% | -11.95% | -76.31%   | -94.43%   |
| Rating Volatility (notch weighted)       | 19.50% | 22.20%  | 84.14%    | 97.01%    |
| Stability Rate                           | 94.23% | 90.32%  | 79.28%    | 76.31%    |
| Withdrawal Rate                          | 6.36%  | 4.09%   | 2.97%     | 2.30%     |

Resecuritization CDOs (CDOs of structured finance securities) dominated CDO downgrades in 2005, claiming an 82% share of all downgrades (Figure 16). The resecuritization sector has suffered from its exposure to a handful of persistently weak segments of the ABS market, namely manufactured housing, aircraft leases, and franchise loans.<sup>16</sup> HY CBOs and synthetic arbitrage CDOs tied for a very distant second place.

| CDO Deal Type           | Ratings Outstanding on 1/1/2005 | Downgrades in 2005 | Upgrades in 2005 | Withdrawals in 2005 | Downgrade Rate in 2005 | Upgrade Rate in 2005 | % of Total Downgrades | % of Total Upgrades |
|-------------------------|---------------------------------|--------------------|------------------|---------------------|------------------------|----------------------|-----------------------|---------------------|
| HY CBOs                 | 519                             | 5                  | 24               | 33                  | 1.0%                   | 4.8%                 | 5.6%                  | 51.1%               |
| HY CLOs                 | 940                             | 2                  | 4                | 110                 | 0.2%                   | 0.5%                 | 2.2%                  | 8.5%                |
| Resecuritization        | 763                             | 73                 | 12               | 20                  | 9.7%                   | 1.6%                 | 82.0%                 | 25.5%               |
| Synthetic Arbitrage     | 310                             | 5                  | 1                | 16                  | 1.7%                   | 0.3%                 | 5.6%                  | 2.1%                |
| Investment-grade CBOs   | 121                             | 2                  | 2                | 4                   | 1.7%                   | 1.7%                 | 2.2%                  | 4.3%                |
| Balance Sheet Cash Flow | 62                              | 0                  | 0                | 9                   | 0.0%                   | 0.0%                 | 0.0%                  | 0.0%                |
| Balance Sheet Synthetic | 44                              | 0                  | 0                | 4                   | 0.0%                   | 0.0%                 | 0.0%                  | 0.0%                |
| Market Value            | 82                              | 1                  | 0                | 24                  | 1.4%                   | 0.0%                 | 1.1%                  | 0.0%                |
| Preferred Stock         | 144                             | 0                  | 0                | 0                   | 0.0%                   | 0.0%                 | 0.0%                  | 0.0%                |
| Emerging Market         | 33                              | 0                  | 0                | 12                  | 0.0%                   | 0.0%                 | 0.0%                  | 0.0%                |
| Other                   | 66                              | 1                  | 4                | 15                  | 1.7%                   | 6.8%                 | 1.1%                  | 8.5%                |

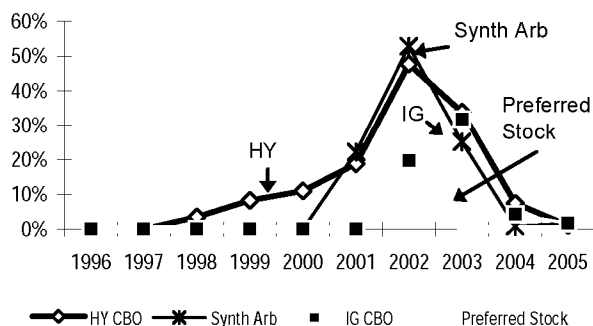
15. See "U.S. High-Yield CBOs: Analyzing the Performance of a Beleaguered CDO Category," Moody's Structured Finance Special Report, January 21, 2003.

16. See "Rating Actions in the U.S. CDO Market: Year-to-Date Review – June 2005," Moody's Structured Finance Special Report, August 19, 2005.

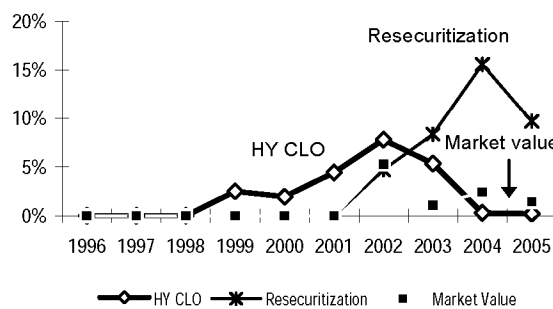
Figure 17 compares the annual downgrade and upgrade rates of several CDO deal types. Almost all CDO deal types experienced some distress in 2002 and 2003, but most have stabilized to a large extent (Figures 17a and 17b). Furthermore, upgrades for almost all CDO categories have been low to non-existent, but have been slowly increasing starting from 2003 (Figures 17c and 17d). HY CBOs accounted for the largest share of upgrades in 2005, primarily due to improvements in overcollateralization.

**Figure 17 – Annual Downgrade and Upgrade Rates for Select US CDO Deal Types**

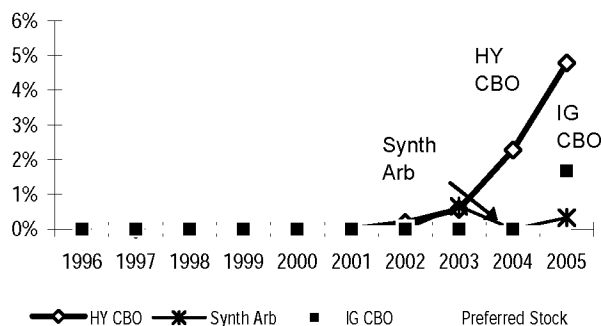
**Figure 17a - Annual Downgrade Rates**



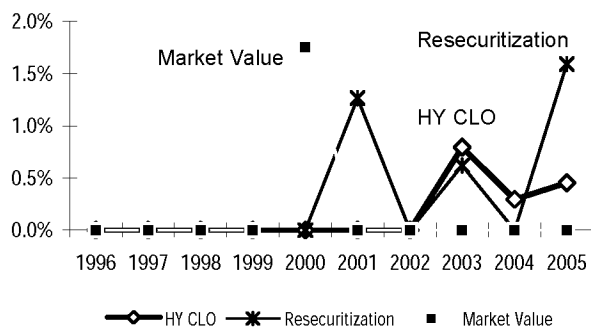
**Figure 17b – Annual Downgrade Rates**



**Figure 17c - Annual Upgrade Rates**



**Figure 17d – Annual Upgrade Rates**



Because of the unprecedented distress in the HY CBO category and its impact on the overall CDO sector, in the next section, we compare performance in the CDO sector including and excluding HY CBOs.

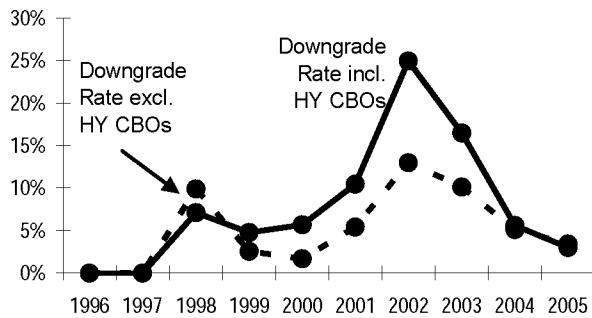
## US CDOs EXCLUDING HY CBOs

The US CDO sector as a whole has finally shaken off the influence of the HY CBO category. For the first time since 1998, the downgrade rate for US CDOs, excluding HY CBOs, at 3.4% was higher than the downgrade rate of 3.0% when HY CBOs are included (Figure 18a). This is very different from the past, as evidenced by comparing the one-year average downgrade rate over 1996-2004 with (12.1%) and without (7.4%) HY CBOs (Figure 18d). The historical difference is even wider when the average is weighted by the number of notches downgraded (49.7% with HY CBOs versus 29.5% without).

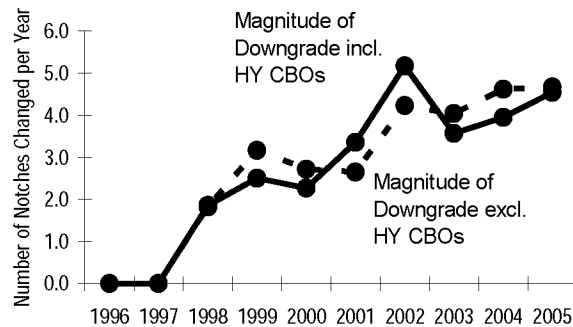
Examining the rating drift tells much the same story. The rating drift for 2005 is more negative at -13.5% when excluding HY CBOs than the drift of -8.7% when including them (Figure 18c). The magnitude of downgrades in 2005 was roughly the same using either criterion (Figure 18b). Therefore, in a reversal, the HY CBO sector is now a net positive to US CDO rating transition performance.

**Figure 18 – Comparison of Rating Transition Trends for US CDOs including and excluding HY CBOs**

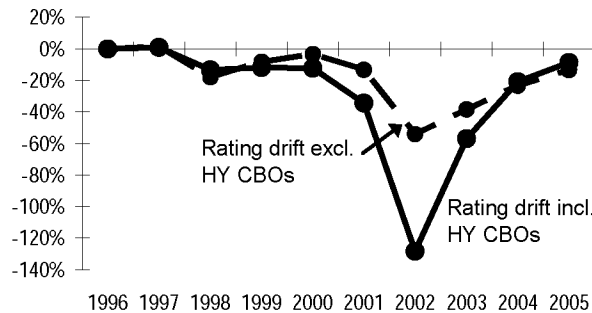
**Figure 18a – Downgrade Rates**



**Figure 18b – Magnitude of Downgrades**



**Figure 18c – Rating Drift**



**Figure 18d – Annual Rating Transition Statistics**

|                                    | Excl. HY CBOs in 2005 | Excl. HY CBOs 1996-2004 | Incl. HY CBOs 1996-2004 |
|------------------------------------|-----------------------|-------------------------|-------------------------|
| Downgrade Rate                     | 3.42%                 | 7.36%                   | 12.14%                  |
| Upgrade Rate                       | 0.94%                 | 0.54%                   | 0.57%                   |
| Downgrade Rate (notch weighted)    | 15.95%                | 29.53%                  | 49.70%                  |
| Upgrade Rate (notch weighted)      | 2.48%                 | 1.10%                   | 1.16%                   |
| Rating Drift (notch weighted)      | -13.47%               | -28.43%                 | -48.55%                 |
| Rating Volatility (notch weighted) | 18.43%                | 30.63%                  | 50.86%                  |
| Stability Rate                     | 95.65%                | 92.10%                  | 87.29%                  |

## US CMBS

Out of a total universe of 3,600 US CMBS ratings from 434 deals at the beginning of 2005, 122 ratings from 53 deals were downgraded and 571 ratings from 145 deals were upgraded in 2005. The downgrade rate fell to 3.5% from 5.7% in 2004, while the upgrade rate almost doubled from 8.8% in 2004 to 16.4% in 2005 (Figure 19a).

The downgrades of US CMBS securities that occurred in 2005 were prompted by the poor performance of the collateral, in particular realized and anticipated losses from specially serviced loans and LTV dispersion. Of the CMBS upgrades in 2005, 61% resulted from increased credit support due to loan payoffs, an additional 22% from increased credit support as well as improved pool performance, 12% from strong collateral performance, and 5% from other reasons.

A noteworthy occurrence in the US CMBS sector in 2005 was a surge in the cases of defeasance – situations where borrowers replaced loans with a pool of Treasury bills designed to pay in full all remaining principal and interest. This was often done in order to take advantage of the higher values in the commercial real estate market by taking out a new loan with significantly higher proceeds. This had a significant upward impact on credit as a risky loan that had some credit support allocated to it was replaced by Treasuries which did not need allocated credit support, creating an effective boost in subordination and resulting in higher numbers of upgrades.

The magnitude of downgrades declined to 1.8 from 2.2 in 2004, while the magnitude of upgrades was flat at 2.3 (Figure 19b). The large increase in upgrades caused the rating drift to rise to an all-time high of 31.4% in 2005 versus 7.7% in 2004, and also caused rating volatility to rise from 32.5% to 44.0% (Figure 19c).

Viewing cumulative rating changes by vintage shows the effect that seasoning has on CMBS ratings (Figure 19d). As the deals age, either the collateral performs worse than expected leading to downgrades or as in the majority of the cases, strong collateral performance and/or increased credit support due to amortization and loan pay-downs lead to upgrades. Therefore, as time passes, ratings tend to migrate either upward or downward causing the cumulative rating change rate for the vintage to increase.<sup>17</sup> This pattern can be clearly seen as older vintages experience progressively higher rates of rating changes. With the exception of the 2000 vintage, cumulative upgrade rates have so far significantly exceeded cumulative downgrade rates for all CMBS vintages since 1995. The 2000 vintage has under-performed because that year saw the lowest vacancy rates and the highest rents for all major property types, so loans underwritten in that year often faced more difficult market environments if the owner/borrowers had to replace tenants.<sup>18</sup>

---

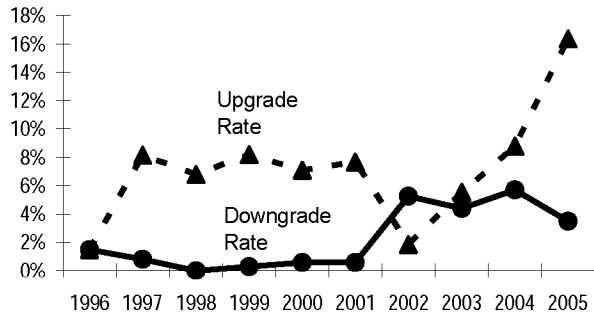
17. This phenomenon is related to the age profile of structured finance rating transitions, first documented in "Structured Finance Rating Transitions: 1983-2002", Moody's Special Comment, January 2003.

18. For more information, see "CMBS Loan Delinquency and Vintage: Why 2000 Was Not A Very Good Year," Moody's Structured Finance Special Report, December 1, 2003.

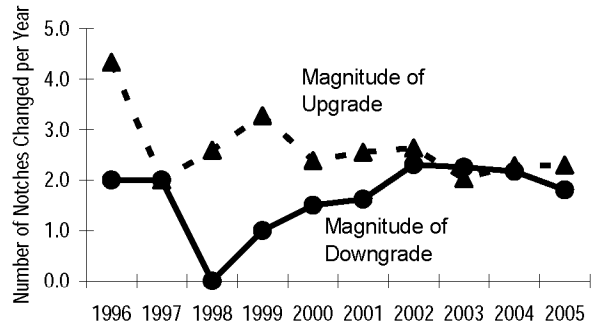


## Figure 19 – Rating Transition Trends for US CMBS

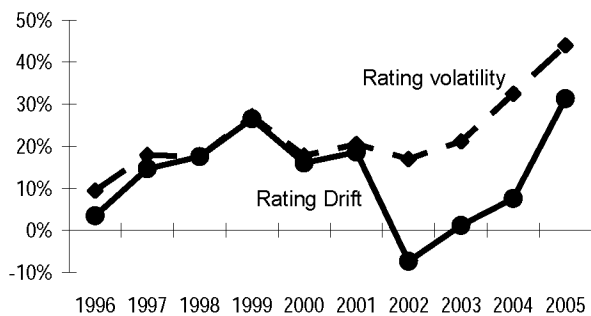
### Figure 19a - Downgrade Rates and Upgrade Rates



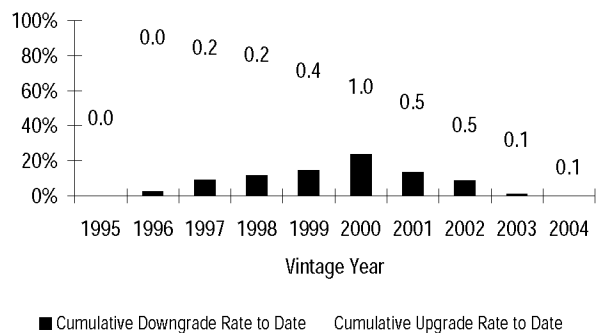
### Figure 19b – Magnitude of Downgrades and Upgrades



### Figure 19c – Rating Drift and Rating Volatility



### Figure 19d – Cumulative Downgrade and Upgrade Rates (with Downgrade-to-Upgrade Ratios)



|  | 2005   | 2004   | 1996-2005 | 1996-2004 |
|--|--------|--------|-----------|-----------|
| Downgrade Rate                           | 3.50%  | 5.72%  | 3.55%     | 3.56%     |
| Upgrade Rate                             | 16.36% | 8.79%  | 8.71%     | 6.34%     |
| Downgrade/Upgrade ratio                  | 0.21   | 0.65   | 0.41      | 0.56      |
| Downgrade Rate (notch weighted)          | 6.30%  | 12.44% | 7.48%     | 7.84%     |
| Upgrade Rate (notch weighted)            | 37.67% | 20.09% | 20.49%    | 15.16%    |
| Downgrade/Upgrade ratio (notch weighted) | 0.17   | 0.62   | 0.36      | 0.52      |
| Rating Drift (notch weighted)            | 31.37% | 7.65%  | 13.01%    | 7.32%     |
| Rating Volatility (notch weighted)       | 43.98% | 32.53% | 27.96%    | 23.00%    |
| Stability Rate                           | 80.15% | 85.49% | 87.74%    | 90.10%    |
| Withdrawal Rate                          | 6.08%  | 8.95%  | 6.87%     | 7.11%     |

## US RMBS

The US RMBS sector continued to be a bright spot for US structured finance. Out of a total universe of 5,545 US RMBS ratings from 1705 deals at the beginning of 2005, 50 ratings from 27 deals were downgraded in 2005, whereas 363 ratings from 120 deals were upgraded in 2005. The RMBS downgrade rate for 2005 was 0.9%, an increase over the 0.1% downgrade rate in 2004, but still low and the sixth consecutive year that the rate and has stayed below 1% (Figure 20a). The upgrade rate declined to 6.8% from 8.8% in 2004.

37 of the 50 RMBS downgrades affected securitizations issued by Credit Suisse First Boston Mortgage Securities Corp. (CSFB). The underlying loans are experiencing higher cumulative losses than originally expected. At the same time, 77 securities from CSFB RMBS transactions were upgraded due to a combination of the strong performance of the collateral and a build-up of credit enhancement. An additional 231 tranches from 83 residential mortgage-backed securitizations from various issuers were upgraded on July 27, 2005 following Moody's review of jumbo RMBS deals with pool factors of less than 50% issued from 2000 through 2004. The reasons for the upgrade were cited as the low losses experienced by the securitization pools and the significant increase in tranche credit enhancement levels, due to high prepayment rates and the shifting interest structure of the deals.<sup>19</sup>

The average number of notches downgraded in 2005 was 4.9, similar to the magnitude of rating downgrades in 2004 of 4.5, while the magnitude of upgrades for 2005 was 2.5, also in line with last year's figure of 2.7 (Figure 20b). The rating drift was still positive at 12.4%, but decreased from the year-prior drift of 23.5% (Figure 20c), while the rating volatility declined slightly to 21.5% from 24.4% in 2004.

With the exception of the 1996 vintage, all RMBS deals issued between 1995 and 2004 have experienced significantly higher cumulative upgrade rates than downgrade rates (Figure 20d). Despite their relatively unseasoned status, even deals issued between 2001 and 2003 have experienced high cumulative upgrade rates, reaching 37.0% to date for the 2002 vintage and already 8.5% for the 2003 vintage. The primary driver is the unusually strong mortgage credit environment of the past few years. Meanwhile, the high cumulative downgrade rate experienced by the 1996 vintage can be attributed to the poor performance of DLJ's Quality mortgage deals issued in that year. The underlying pools have experienced high losses and had subprime characteristics.<sup>20</sup>

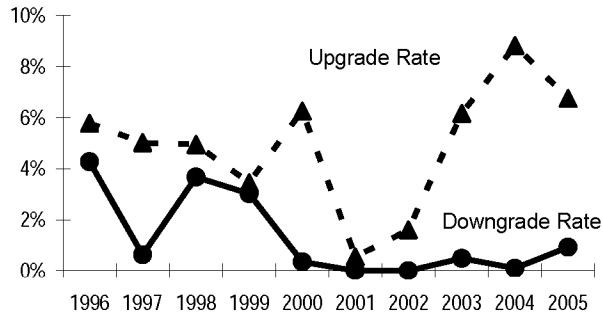
---

19. See the related Moody's press release, "Moody's Upgrade 231 Tranches of Jumbo Prime Residential Mortgage Backed Securities," from July 27, 2005.

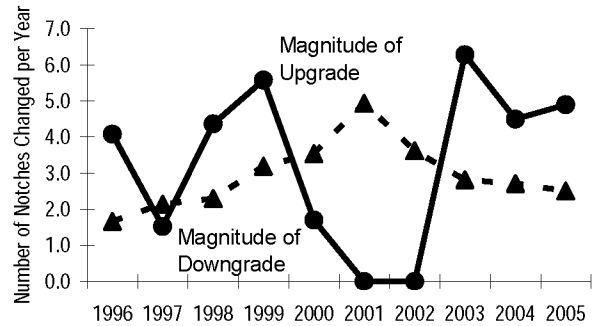
20. See the related Moody's press releases, "Moody's Downgrades 101 Classes of Quality Mortgage MBS," dated May 1, 1998 and "Moody's Downgrades 94 Classes from DLJ's Quality Mortgage Deals," dated July 30, 1999.

## Figure 20 – Rating Transition Trends for US RMBS

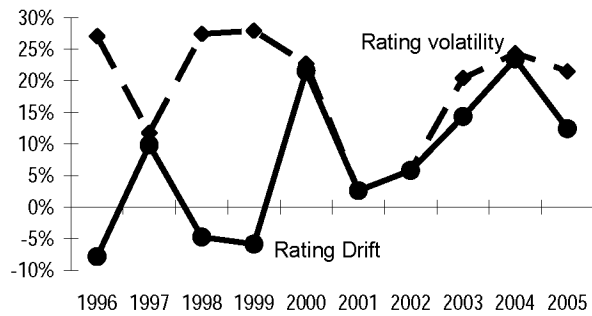
### Figure 20a - Downgrade Rates and Upgrade Rates



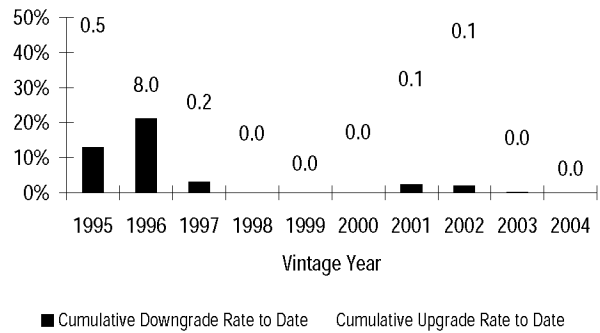
### Figure 20b – Magnitude of Downgrades and Upgrades



### Figure 20c – Rating Drift and Rating Volatility



### Figure 20d – Cumulative Downgrade and Upgrade Rates (with Downgrade-to-Upgrade Ratios)



### Figure 20e - Annual Rating Transition Statistics

|  | 2005   | 2004   | 1996-2005 | 1996-2004 |
|--|--------|--------|-----------|-----------|
| Downgrade Rate                           | 0.93%  | 0.10%  | 1.24%     | 1.30%     |
| Upgrade Rate                             | 6.75%  | 8.82%  | 5.24%     | 4.96%     |
| Downgrade/Upgrade ratio                  | 0.14   | 0.01   | 0.24      | 0.27      |
| Downgrade Rate (notch weighted)          | 4.56%  | 0.44%  | 5.59%     | 5.78%     |
| Upgrade Rate (notch weighted)            | 16.94% | 23.92% | 13.95%    | 13.40%    |
| Downgrade/Upgrade ratio (notch weighted) | 0.27   | 0.02   | 0.41      | 0.44      |
| Rating Drift (notch weighted)            | 12.38% | 23.48% | 8.36%     | 7.62%     |
| Rating Volatility (notch weighted)       | 21.50% | 24.37% | 19.55%    | 19.19%    |
| Stability Rate                           | 92.32% | 91.08% | 93.52%    | 93.74%    |
| Withdrawal Rate                          | 6.04%  | 19.04% | 9.95%     | 10.67%    |

## Regional Comparisons of Rating Transitions

### EUROPEAN AND US RATING TRANSITION RATES

Out of a total universe of 3,713 European structured finance ratings from 1627 deals at the beginning of 2005, 71 ratings from 43 deals were downgraded and 260 ratings from 148 deals were upgraded in 2005. The downgrade rate decreased by a factor of 2, from 4.0% in 2004 to 2.0% in 2005, and the upgrade rate increased by more than a factor of 4, jumping from 1.8% to 7.3% (see Figure 21a, where the downgrade rates are marked to be negative for clarity).<sup>21</sup> The downgrade rate in Europe and the US were the same in 2005, but the upgrade rate for Europe was higher.

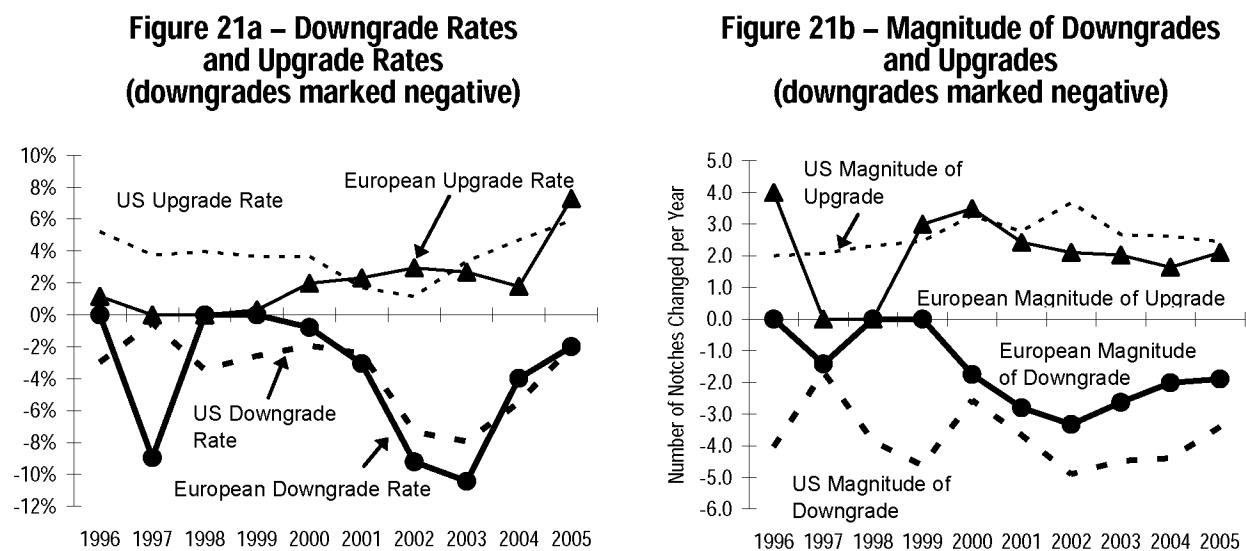
CDOs accounted for 78.9% of the structured finance downgrades in Europe in 2005, a substantial portion of which involved synthetic arbitrage deals. The bankruptcy of Delphi Corporation was cited as a factor in most of these downgrades. All European downgrade for the year were caused by the poor performance of the underlying collateral.

All sectors of European structured finance (ABS, CDO, CMBS, and RMBS) experienced some upgrades in 2005, but CDOs took the largest share of upgrades (46.2%) followed by RMBS (34.6%). Most upgrades were caused by the strong performance of the collateral, a build-up of credit enhancement, or a combination of both.

The magnitude of rating downgrades ticked down to 1.9 from 2.0 last year, while the average number of notches for upgrades increased to 2.1 from 1.6 (Figure 21b). While the size of rating downgrades and upgrades decreased in 2005 for the US, they are still higher than their European counterparts, which was also typically the case historically.

The rating drift was strongly positive in 2005 after four years in negative territory, similar to what happened in the US market, but unlike the US, European structured finance rating volatility increased, almost doubling because of the increase in both the frequency and magnitude of upgrades (Figure 21c).

**Figure 21 – Comparison of Rating Transition Trends for European and US Structured Finance**



**Figure 21c – Annual Rating Transition Statistics**

|  | Europe |        |           | US     |         |           |
|--|--------|--------|-----------|--------|---------|-----------|
|  | 2005   | 2004   | 1996-2004 | 2005   | 2004    | 1996-2004 |
| Downgrade Rate                           | 1.99%  | 3.98%  | 5.91%     | 2.02%  | 5.51%   | 4.67%     |
| Upgrade Rate                             | 7.30%  | 1.78%  | 2.12%     | 5.91%  | 4.69%   | 3.35%     |
| Downgrade/Upgrade ratio                  | 0.27   | 2.23   | 2.79      | 0.34   | 1.17    | 1.39      |
| Downgrade Rate (notch weighted)          | 3.76%  | 7.99%  | 15.51%    | 6.88%  | 24.20%  | 20.40%    |
| Upgrade Rate (notch weighted)            | 15.33% | 2.91%  | 4.38%     | 14.47% | 12.24%  | 8.81%     |
| Downgrade/Upgrade ratio (notch weighted) | 0.25   | 2.74   | 3.54      | 0.48   | 1.98    | 2.30      |
| Rating Drift (notch weighted)            | 11.57% | -5.08% | -11.12%   | 7.59%  | -11.96% | -11.60%   |
| Rating Volatility (notch weighted)       | 19.09% | 10.91% | 19.89%    | 21.35% | 36.44%  | 29.21%    |
| Stability Rate                           | 90.71% | 94.24% | 91.97%    | 92.07% | 89.81%  | 91.98%    |
| Withdrawal Rate                          | 8.13%  | 7.21%  | 6.70%     | 6.63%  | 11.84%  | 8.82%     |

21. A separate study for European structured finance rating transitions is forthcoming. See also "EMEA Structured Finance Rating Transitions: 2004 Update," Moody's International Structured Finance Special Report, February 22, 2005.

Figure 22 compares the 2005 rating transition matrices for Europe and the US. Stability rates were similar in both regions except for the B-rating category, where Europe showed less stability. However, for all rating categories except Aa, upgrade rates were higher in Europe than in the US, often by a substantial amount. There were also no transitions into the Caa or below category for investment-grade ratings in Europe.

| <b>Figure 22 – Comparison of European and US Structured Finance Annual Rating Transition Matrices</b> |            |                    |          |            |           |          |                     |
|---|------------|--------------------|----------|------------|-----------|----------|---------------------|
| <b>Europe in 2005</b>   |            | <b>Ratings to:</b> |          |            |           |          |                     |
| <b>Ratings from:</b>  | <b>Aaa</b> | <b>Aa</b>          | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa or below</b> |
| Aaa   | 99.34%     | 0.66%              |          |            |           |          |                     |
| Aa  | 6.48%      | 91.32%             | 2.07%    | 0.14%      |           |          |                     |
| A   | 0.61%      | 7.36%              | 90.92%   | 0.98%      | 0.12%     |          |                     |
| Baa   | 0.45%      | 0.45%              | 6.26%    | 92.25%     | 0.60%     |          |                     |
| Ba  |            |                    | 0.46%    | 7.41%      | 90.28%    | 1.39%    | 0.46%               |
| B   |            |                    |          |            | 11.59%    | 79.71%   | 8.70%               |
| Caa or below  |            |                    |          |            |           |          | 100.00%             |
| <b>US in 2005</b>   |            |                    |          |            |           |          |                     |
| <b>Ratings from:</b>  | <b>Aaa</b> | <b>Aa</b>          | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa or below</b> |
| Aaa   | 99.74%     | 0.18%              | 0.05%    |            | 0.02%     |          |                     |
| Aa  | 8.57%      | 90.42%             | 0.65%    | 0.20%      | 0.08%     | 0.06%    | 0.03%               |
| A   | 1.90%      | 5.30%              | 91.70%   | 0.71%      | 0.18%     | 0.05%    | 0.16%               |
| Baa   | 0.34%      | 0.54%              | 3.92%    | 93.29%     | 1.12%     | 0.47%    | 0.32%               |
| Ba  | 0.12%      | 0.12%              | 0.12%    | 2.96%      | 92.81%    | 2.78%    | 1.09%               |
| B   | 0.11%      |                    | 0.11%    |            | 2.26%     | 90.01%   | 7.52%               |
| Caa or below  |            |                    |          |            | 0.11%     | 0.11%    | 99.78%              |

### ASIA-PACIFIC AND US RATING TRANSITION RATES

Out of a total universe of 1,304 Asia-Pacific structured finance ratings from 742 deals at the beginning of 2005, only five ratings from four deals were downgraded and 90 ratings from 58 deals were upgraded in 2005. The downgrade rate increased from a low 0.2% in 2004 to a still small 0.4% in 2005, while the upgrade rate increased slightly from 7.3% to 7.7% (see Figure 23a, where the downgrade rates are marked to be negative for clarity).<sup>22</sup> Despite improvements in the US, the downgrade rate in 2005 was still significantly lower and the upgrade rate higher in the Asia-Pacific region than in the US, although the gap between the upgrade rates narrowed.

Upgrades in the Asia-Pacific region occurred in all four broad structured finance sectors, but were concentrated in the ABS (42.2%) and RMBS (25.6%) sectors. Most of the upgrades resulted from a build-up of credit enhancement, sometimes combined with the better-than-anticipated collateral performance.

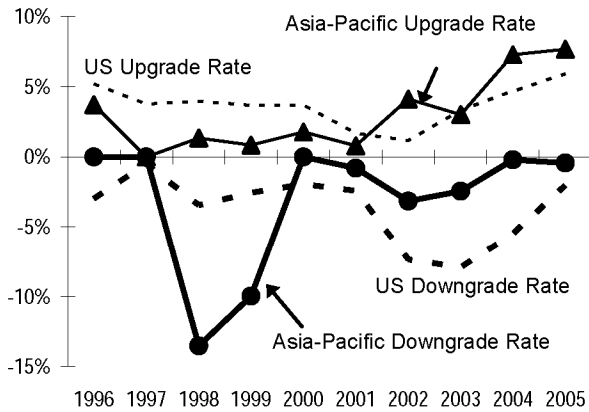
The average number of notches downgraded increased marginally to 1.6 in 2005 from 1.5 in 2004, while the average number of notches upgraded increased slightly less than a notch, from 2.6 to 3.4 in 2005 (Figure 23b). The magnitude of downgrades continues to be lower in the Asia-Pacific region than the US, but contrary to historical experience, the magnitude of upgrades was higher in 2005 in the Asia-Pacific versus the US.

As a result of not only the increased upgrade rate, but the increased size of upgrades in 2005, both the rating drift and rating volatility increased for the Asia-Pacific region in 2005 relative to 2004, and were higher than the figures for the US (Figure 23c).

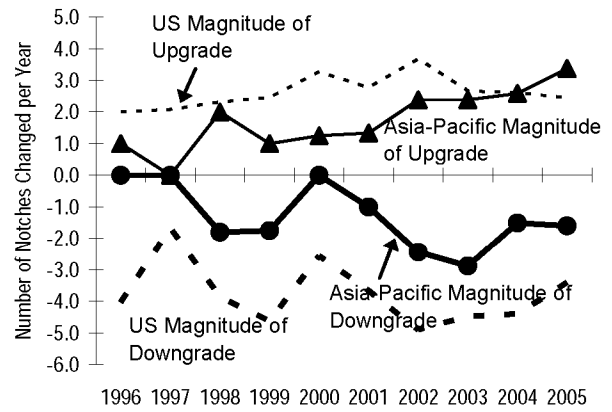
22. More detailed analysis of the 2005 rating transition experience for Japanese structured finance will be published separately. See also "Japanese Structured Finance Rating Transitions: 1998-2004," Moody's International Structured Finance Special Report, April 8, 2005.

**Figure 23 – Comparison of Rating Transition Trends for Asia-Pacific and US Structured Finance**

**Figure 23a – Downgrade Rates and Upgrade Rates  
(downgrades marked negative)**



**Figure 23b – Magnitude of Downgrades and Upgrades  
(downgrades marked negative)**



**Figure 23c – Annual Rating Transition Statistics**

|  | Asia-Pacific |        |           | US     |         |           |
|--|--------------|--------|-----------|--------|---------|-----------|
|  | 2005         | 2004   | 1996-2004 | 2005   | 2004    | 1996-2004 |
| Downgrade Rate                           | 0.43%        | 0.22%  | 1.98%     | 2.02%  | 5.51%   | 4.67%     |
| Upgrade Rate                             | 7.68%        | 7.28%  | 4.04%     | 5.91%  | 4.69%   | 3.35%     |
| Downgrade/Upgrade ratio                  | 0.06         | 0.03   | 0.50      | 0.34   | 1.17    | 1.39      |
| Downgrade Rate (notch weighted)          | 0.68%        | 0.33%  | 4.40%     | 6.88%  | 24.20%  | 20.40%    |
| Upgrade Rate (notch weighted)            | 25.93%       | 18.79% | 9.74%     | 14.47% | 12.24%  | 8.81%     |
| Downgrade/Upgrade ratio (notch weighted) | 0.03         | 0.02   | 0.47      | 0.48   | 1.98    | 2.30      |
| Rating Drift (notch weighted)            | 25.25%       | 18.47% | 5.34%     | 7.59%  | -11.96% | -11.60%   |
| Rating Volatility (notch weighted)       | 26.61%       | 19.12% | 14.14%    | 21.35% | 36.44%  | 29.21%    |
| Stability Rate                           | 91.90%       | 92.50% | 93.98%    | 92.07% | 89.81%  | 91.98%    |
| Withdrawal Rate                          | 20.17%       | 18.08% | 13.06%    | 6.63%  | 11.84%  | 8.82%     |

While the single-A and Baa rating categories exhibited lower stability in the Asia-Pacific than in the US in 2005, this was due to much higher upgrade rates (Figure 24). In all other rating categories, the Asia-Pacific had superior rating stability and no downgrades. As in 2004, there were no transitions into the Caa or below rating category in the Asia-Pacific region in 2005.

**Figure 24 – Comparison of Asia-Pacific and US Structured Finance Annual Rating Transition Matrices**

| Asia-Pacific in 2005 |         | Ratings to: |        |        |        |        |              |  |
|----------------------|---------|-------------|--------|--------|--------|--------|--------------|--|
| Ratings from:        | Aaa     | Aa          | A      | Baa    | Ba     | B      | Caa or below |  |
| Aaa                  | 100.00% |             |        |        |        |        |              |  |
| Aa                   | 8.38%   | 91.62%      |        |        |        |        |              |  |
| A                    | 10.53%  | 4.51%       | 83.96% | 1.00%  |        |        |              |  |
| Baa                  | 4.08%   | 2.04%       | 7.48%  | 85.71% | 0.68%  |        |              |  |
| Ba                   |         |             | 2.27%  | 2.27%  | 95.45% |        |              |  |
| B                    |         |             | 8.00%  |        |        | 92.00% |              |  |
| Caa or below         |         |             |        |        |        |        | 100.00%      |  |
| <b>US in 2005</b>    |         |             |        |        |        |        |              |  |
| Ratings from:        | Aaa     | Aa          | A      | Baa    | Ba     | B      | Caa or below |  |
| Aaa                  | 99.74%  | 0.18%       | 0.05%  |        | 0.02%  |        |              |  |
| Aa                   | 8.57%   | 90.42%      | 0.65%  | 0.20%  | 0.08%  | 0.06%  | 0.03%        |  |
| A                    | 1.90%   | 5.30%       | 91.70% | 0.71%  | 0.18%  | 0.05%  | 0.16%        |  |
| Baa                  | 0.34%   | 0.54%       | 3.92%  | 93.29% | 1.12%  | 0.47%  | 0.32%        |  |
| Ba                   | 0.12%   | 0.12%       | 0.12%  | 2.96%  | 92.81% | 2.78%  | 1.09%        |  |
| B                    | 0.11%   |             | 0.11%  |        | 2.26%  | 90.01% | 7.52%        |  |
| Caa or below         |         |             |        |        | 0.11%  | 0.11%  | 99.78%       |  |

### NON-US AMERICAS AND US RATING TRANSITION RATES

While the structured finance market in the non-US Americas – defined as Canada and Latin America – is small, it is growing and rates some mention. Out of a total universe of 289 structured finance ratings from 137 deals from the non-US Americas at the beginning of 2005, only two ratings from one deal was downgraded and 16 ratings from 7 deals were upgraded in 2005. The downgrade rate decreased from a low 1.1% to an even lower 0.7%, and the upgrade rate increased from 2.6% to 5.8% (see Figure 25a, where the downgrade rates are marked to be negative for clarity).

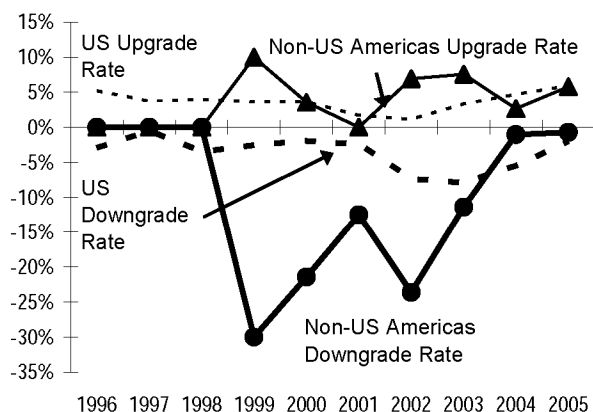
This is a far cry from the state of the market in 2002 and 2003, when downgrade rates hit 23.6% and 11.4% respectively. All the downgrades in 2002 and 2003 affected Latin American structured finance securities and most were caused by the substantial volatility in some of the countries in the region during that time period, e.g. the oil strike in Venezuela, the Argentine default, and the downgrade of Brazil.

The 2005 downgrades affected two classes of one Latin American mortgage deal, whose ratings were lowered following the downgrade of the government of Belize's foreign currency ceiling. Three of the 16 upgrades occurred among Latin American ABS and resulted from the upgrade of a third party, and the remaining 13 upgrades occurred among Canadian CMBS as a result of improved pool performance and/or increased subordination levels.

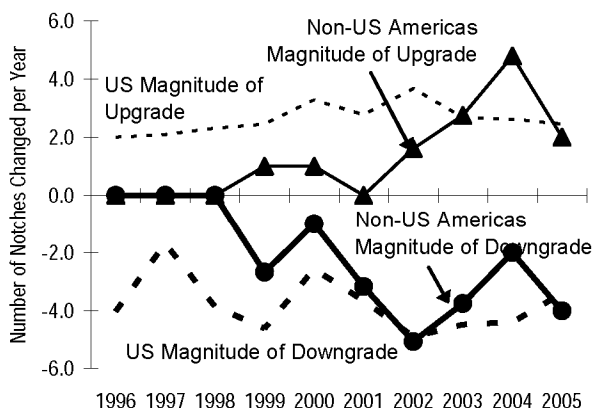
The average number of notches downgraded doubled from 2.0 to 4.0 in 2005, while the average number of notches upgraded more than halved from 4.8 to 2.0 in 2005 (Figure 25b). Because of the increased magnitude of downgrades and decreased magnitude of upgrades, the rating drift for the non-US Americas declined in 2005, to 8.7% from 10.6%, and the rating volatility stayed flat at 14.5% versus 14.8% in 2004.

**Figure 25 – Comparison of Rating Transition Trends for Structured Finance in the US and Non-US Americas**

**Figure 25a – Downgrade Rates and Upgrade Rates (downgrades marked negative)**



**Figure 25b – Magnitude of Downgrades and Upgrades (downgrades marked negative)**



**Figure 25c – Annual Rating Transition Statistics**

|  | Non-US Americas |        |           | US     |         |           |
|--|-----------------|--------|-----------|--------|---------|-----------|
|  | 2005            | 2004   | 1996-2004 | 2005   | 2004    | 1996-2004 |
| Downgrade Rate                           | 0.73%           | 1.06%  | 9.97%     | 2.02%  | 5.51%   | 4.67%     |
| Upgrade Rate                             | 5.81%           | 2.64%  | 4.34%     | 5.91%  | 4.69%   | 3.35%     |
| Downgrade/Upgrade ratio                  | 0.13            | 0.40   | 2.30      | 0.34   | 1.17    | 1.39      |
| Downgrade Rate (notch weighted)          | 2.90%           | 2.11%  | 36.55%    | 6.88%  | 24.20%  | 20.40%    |
| Upgrade Rate (notch weighted)            | 11.62%          | 12.66% | 12.16%    | 14.47% | 12.24%  | 8.81%     |
| Downgrade/Upgrade ratio (notch weighted) | 0.25            | 0.17   | 3.00      | 0.48   | 1.98    | 2.30      |
| Rating Drift (notch weighted)            | 8.71%           | 10.55% | -24.39%   | 7.59%  | -11.96% | -11.60%   |
| Rating Volatility (notch weighted)       | 14.52%          | 14.78% | 48.70%    | 21.35% | 36.44%  | 29.21%    |
| Stability Rate                           | 93.47%          | 96.31% | 85.69%    | 92.07% | 89.81%  | 91.98%    |
| Withdrawal Rate                          | 9.34%           | 3.63%  | 2.57%     | 6.63%  | 11.84%  | 8.82%     |



Structured finance ratings were more stable in the non-US Americas than in the US in 2005, for all rating categories except Aa and single-A, which were less stable because of higher rates of upgrades (Figure 26). Only the single-B rating category experienced a transition into the Caa or below rating category in 2005.

**Figure 26 – Comparison of Annual Rating Transition Matrices for the Non-US Americas and US Structured Finance**

| Non-US Americas in 2005 |         | Ratings to: |        |        |        |        |              |  |
|-------------------------|---------|-------------|--------|--------|--------|--------|--------------|--|
| Ratings from:           | Aaa     | Aa          | A      | Baa    | Ba     | B      | Caa or below |  |
| Aaa                     | 100.00% |             |        |        |        |        |              |  |
| Aa                      | 15.79%  | 84.21%      |        |        |        |        |              |  |
| A                       | 2.86%   | 2.86%       | 91.43% |        | 2.86%  |        |              |  |
| Baa                     |         | 0.96%       |        | 99.04% |        |        |              |  |
| Ba                      |         |             |        | 2.94%  | 97.06% |        |              |  |
| B                       |         |             |        |        | 5.33%  | 92.00% | 2.67%        |  |
| Caa or below            |         |             |        |        |        |        | 100.00%      |  |
| US in 2005              |         | Ratings to: |        |        |        |        |              |  |
| Ratings from:           | Aaa     | Aa          | A      | Baa    | Ba     | B      | Caa or below |  |
| Aaa                     | 99.74%  | 0.18%       | 0.05%  |        | 0.02%  |        |              |  |
| Aa                      | 8.57%   | 90.42%      | 0.65%  | 0.20%  | 0.08%  | 0.06%  | 0.03%        |  |
| A                       | 1.90%   | 5.30%       | 91.70% | 0.71%  | 0.18%  | 0.05%  | 0.16%        |  |
| Baa                     | 0.34%   | 0.54%       | 3.92%  | 93.29% | 1.12%  | 0.47%  | 0.32%        |  |
| Ba                      | 0.12%   | 0.12%       | 0.12%  | 2.96%  | 92.81% | 2.78%  | 1.09%        |  |
| B                       | 0.11%   |             | 0.11%  |        | 2.26%  | 90.01% | 7.52%        |  |
| Caa or below            |         |             |        |        | 0.11%  | 0.11%  | 99.78%       |  |

## RATING TRANSITIONS IN THE DERIVATIVES SECTOR

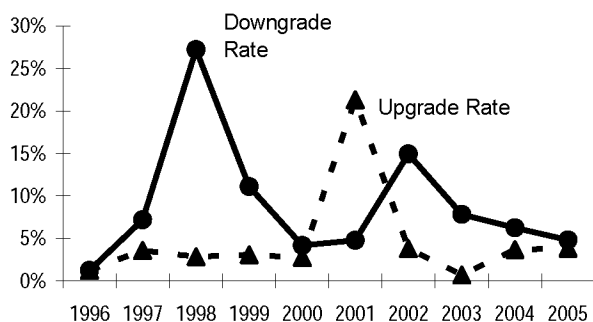
Out of a total universe of 1,656 global credit derivative ratings from 1559 deals at the beginning of 2005, 76 ratings from 73 deals were downgraded and 61 ratings from 58 deals were upgraded in 2005. The downgrade rate declined to 4.8% from 6.3%, while the upgrade rate was flat at 3.9%, compared to 3.7% in 2004 (Figures 27a).

The average number of notches downgraded was also flat at 2.0 for 2005 from 2.1 in 2004, while the magnitude of upgrades increased to 1.8 in 2005 from 1.4 in the previous year (Figure 27b). Although the decrease in downgrades and small increase in upgrades was not enough to push the rating drift above zero, the drift moved closer to positive terrain, increasing from -7.8% to -2.9% in 2005 (Figure 27c). Rating volatility decreased slightly to 16.6% from 18.5% in 2004.

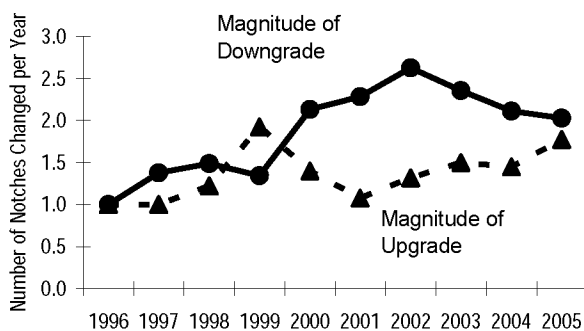
Over 92% of derivative downgrades in 2005 occurred in the structured notes category (Figure 28). Structured notes also accounted for the majority of upgrades, with repackaged securities also making a meaningful contribution. Almost all derivative downgrades and upgrades were triggered by a change in the credit rating of the underlying reference credit.

**Figure 27 – Rating Transition Trends for Global Derivatives**

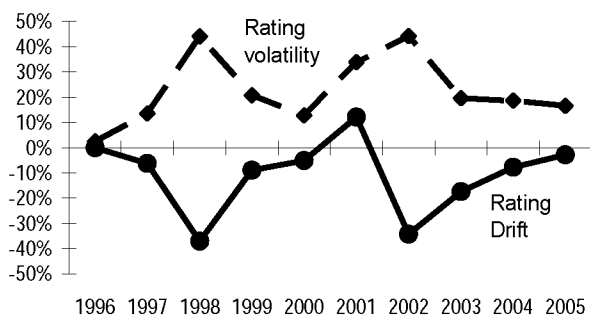
**Figure 27a – Downgrade Rates and Upgrade Rates**



**Figure 27b – Magnitude of Downgrades and Upgrades**



**Figure 27c – Rating Drift and Rating Volatility**



**Figure 27d – Annual Rating Transition Statistics**

|  | 2005   | 2004   | 1996-2004 |
|--|--------|--------|-----------|
| Downgrade Rate                           | 4.80%  | 6.25%  | 9.16%     |
| Upgrade Rate                             | 3.85%  | 3.69%  | 4.96%     |
| Downgrade/Upgrade ratio                  | 1.25   | 1.69   | 1.83      |
| Downgrade Rate (notch weighted)          | 9.73%  | 13.19% | 19.40%    |
| Upgrade Rate (notch weighted)            | 6.82%  | 5.35%  | 6.18%     |
| Downgrade/Upgrade ratio (notch weighted) | 1.43   | 2.46   | 3.10      |
| Rating Drift (notch weighted)            | -2.91% | -7.84% | -13.21%   |
| Rating Volatility (notch weighted)       | 16.55% | 18.54% | 25.58%    |
| Stability Rate                           | 91.35% | 90.05% | 85.87%    |
| Withdrawal Rate                          | 8.82%  | 8.79%  | 10.16%    |

**Figure 28 – Downgrade Rates and Upgrade Rates in 2005 by Deal Type in Global Derivatives**

| Derivative Deal Type  | Ratings Outstanding on 1/1/2005 | Downgrades in 2005 | Upgrades in 2005 | Withdrawals in 2005 | Downgrade Rate in 2005 | Upgrade Rate in 2005 | % of Total Downgrades | % of Total Upgrades |
|-----------------------|---------------------------------|--------------------|------------------|---------------------|------------------------|----------------------|-----------------------|---------------------|
| Structured Notes      | 783                             | 70                 | 37               | 50                  | 9.2%                   | 4.9%                 | 92.1%                 | 60.7%               |
| Repacks               | 547                             | 5                  | 11               | 73                  | 1.0%                   | 2.2%                 | 6.6%                  | 18.0%               |
| Struct. Covered Bonds | 151                             | 0                  | 0                | 5                   | 0.0%                   | 0.0%                 | 0.0%                  | 0.0%                |
| Credit Derivatives    | 43                              | 0                  | 1                | 1                   | 0.0%                   | 2.4%                 | 0.0%                  | 1.6%                |
| Other                 | 132                             | 1                  | 12               | 17                  | 0.8%                   | 9.7%                 | 1.3%                  | 19.7%               |

Ratings in the derivatives sector are heavily linked to global corporate and sovereign ratings and therefore, it is more appropriate to compare derivative rating transitions with corporate rating transitions. With the important exception of the Aaa category, ratings in the derivatives sector were more stable in 2005 than in the corporate sector (Figure 29). The Aaa rating category experienced a rather high 7.7% downgrade rate, all into the Aa category. In addition, 6.5% of derivative securities rated Baa at the beginning of the year were downgraded to below investment-grade as opposed to 4.4% for corporate. All other rating categories in the derivatives sector experienced considerably lower downgrade rates than in the corporate sector. Moreover, unlike the corporate sector, there were no downgrades into the Caa or below category for the derivatives sector in 2005.

**Figure 29 – Comparison of Global Derivatives and Global Corporate Annual Rating Transition Matrices**

| Derivatives in 2005<br>Ratings from:  | Ratings to: |        |        |        |        |        |              |
|---------------------------------------|-------------|--------|--------|--------|--------|--------|--------------|
|                                       | Aaa         | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa                                   | 92.34%      | 7.66%  |        |        |        |        |              |
| Aa                                    | 0.22%       | 99.55% |        | 0.22%  |        |        |              |
| A                                     |             | 0.36%  | 99.27% | 0.36%  |        |        |              |
| Baa                                   |             |        | 2.44%  | 91.06% | 6.10%  | 0.41%  |              |
| Ba                                    |             |        | 4.37%  | 8.74%  | 85.79% | 1.09%  |              |
| B                                     |             |        |        |        | 10.96% | 89.04% |              |
| Caa or below                          |             |        |        |        |        | 13.33% | 86.67%       |
| <b>Corporate in 2005<sup>23</sup></b> |             |        |        |        |        |        |              |
| Ratings from:                         | Aaa         | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa                                   | 95.99%      | 3.51%  | 0.50%  |        |        |        |              |
| Aa                                    | 0.25%       | 97.51% | 1.99%  | 0.12%  | 0.12%  |        |              |
| A                                     | 0.15%       | 1.92%  | 94.16% | 3.70%  | 0.07%  |        |              |
| Baa                                   |             | 0.25%  | 6.57%  | 88.79% | 3.37%  | 0.84%  | 0.17%        |
| Ba                                    |             |        | 0.71%  | 9.61%  | 81.67% | 7.47%  | 0.53%        |
| B                                     |             |        | 0.13%  |        | 8.68%  | 85.35% | 5.83%        |
| Caa or below                          |             |        | 0.37%  | 0.74%  | 1.49%  | 22.72% | 74.67%       |

23. Corporate defaults are included in the Caa or below category.

## Summary and Outlook

---

There are many possible reasons for the remarkable improvement in the performance of structured finance credits in 2005. The large decrease in the overall downgrade rate, down about 60% compared to 2004 and the historical average, was caused primarily by declines in the downgrade rate of the US ABS and global CDO sectors. CDOs have benefited from an improved corporate credit environment. Although Moody's projects that the speculative-grade corporate default rate will rise in 2006, global corporate credit quality is expected to remain relatively healthy.<sup>24</sup> The US ABS sector experienced a relatively quiet year for its historically weaker asset classes – MH, franchise loans, and aircraft leases. These asset classes will likely continue to stabilize, if only because many securities backed by these assets have already been downgraded to low levels and new issuance has been limited.

The upgrade rate in 2005 increased 41% over 2004 and 77% over the historical average, boosted by a flood of upgrades in the US CMBS and RMBS sectors. The RMBS sector has benefited from the strong US residential housing market and the low interest rate environment. If mortgage rates rise and the housing market weakens, as is expected, prepayments on the underlying loans will likely fall, resulting in a slower build-up of credit enhancement and possibly, an increase in defaults among borrowers, for whom refinancing is no longer a feasible alternative. Low interest rates have also been a boon to the CMBS sector, increasing prepayments and giving some loans that might have defaulted, the ability to refinance. Higher values in the commercial real estate market also caused a greater number of cases of defeasance in 2005. Therefore, we will likely see a decrease in the number of upgrades in a rising rate environment, although the housing market has continued to defy all predictions.

Another positive trend in 2005 was the decrease in the magnitude of rating downgrades, down by almost a notch relative to 2004 and 0.7 notches relative to history. However, the size of structured finance downgrades is still much higher than in the corporate sector. We noted in our 2003 transition study that a possible factor in explaining this difference is that the evolution of credit risk is different between the two sectors. In the corporate sector, as an issuer's credit circumstances change, Moody's ratings often change gradually as more is learned over time about how management is reacting to the changed circumstances. In the structured finance sector, very often the underlying asset pool is fixed so that as pool performance begins to deviate from what was expected, the negative or positive trend is unlikely to reverse itself, and therefore, there is less reason to take a gradual approach to rating changes. Nevertheless, Moody's has increased its surveillance efforts in structured finance in order to provide more frequent and timely updates of the credit risk of the securities. This is increasingly important, given the growth of resecuritization CDOs and ABS credit default swaps.

---

24. See Moody's Default Report, "Monthly Default Report – December 2005," January 2006.

## Appendix I: Description of Data Sample and Glossary

---

### DESCRIPTION OF DATA SAMPLE

The data sample for the study covers all structured finance rating observations globally between 1983 and 2005 and uses the following set of criteria:

- Only securities carrying Moody's long-term bond ratings are included, whereas short-term ratings, local ratings, provisional ratings, and rating estimates are excluded.
- Tranches wrapped by financial guarantors, government agencies, or government sponsored enterprises (GSEs) are excluded.
- Interest-only (IO) tranches and residual tranches are excluded.
- Deals whose credit quality are entirely dependent on a single corporate rating, such as single borrower credit tenant lease (CTL) deals in CMBS, are excluded. Derivative ratings, which are generally linked to the credit rating of a single entity, are also excluded from the overall structured finance statistics and are analyzed separately in the report.
- Tranches carrying the same rating from the same deal are collapsed into a single rating observation, with the following exception: if two or more tranches share the same rating in the same deal, but are collateralized by distinct groups of loan pools, then the tranches are not collapsed.

The corporate data set used to compare corporate rating transitions to structured finance rating transitions includes international corporate and sovereign issuers, but excludes municipal ratings.

The structured finance data set used in this study is available through Moody's Structured Finance Default Risk Service (DRS) database and the corporate data set is available through Moody's Corporate Default Risk Service (DRS) database.

### GLOSSARY

#### *Broad Ratings and Refined Ratings*

Broad ratings refer to the following Moody's long-term bond rating categories: Aaa, Aa, A, Baa, Ba, B, and Caa or below. Refined ratings or ratings with numeric modifiers refer to Aaa, Aa1, Aa2, Aa3, A1, A2, A3, Baa1, Baa2, Baa3, Ba1, Ba2, Ba3, B1, B2, B3, Caa1, Caa2, Caa3, Ca, and C. The broad rating category Caa or below includes the following refined ratings: Caa1, Caa2, Caa3, Ca, and C.

#### *Downgrade (Upgrade) Rate*

A security is considered to have been downgraded (upgraded) if its rating at the end of a year is lower (higher) than at the beginning of the year on the basis of ratings with numeric modifiers (also known as refined ratings or modified ratings). The downgrade rate is the number of securities downgraded (or upgraded) divided by the total number of outstanding securities at the beginning of the year, after excluding half of the ratings withdrawn during the year.<sup>25</sup> Note that in measuring downgrade rates and upgrade rates, only ratings at the beginning and the end of the year are considered.

#### *Average Number of Total Notches Downgraded (Upgraded) per Year*

The number of total notches downgraded (upgraded) per year for a downgraded (upgraded) security is the difference in the rating of that security at the end of the year and the beginning of the year based on refined ratings. This term is also referred to as the magnitude, size, or severity of the rating change. The average number of total notches downgraded (upgraded) per year averages this quantity for all downgraded (upgraded) securities over the year. A security can experience multiple rating actions during the year, and therefore, this measure is different from the average number of notches changed per rating action. For example, if a security is downgraded from Baa1 to Baa2 and then Baa2 to Baa3 in the same year, then the average number of notches changed per rating action would be one, but the average number of total notches changed per year would be two.

---

25. Moody's typically calculates structured finance and corporate finance default rates by deducting half of the withdrawn ratings from the rating population outstanding at the beginning of a cohort year. To be consistent, we do the same for the calculation of downgrade rate and upgrade rate in our transition studies, and will adopt this as the standard method in all of our transition/default reports.

### ***Weighted Downgrade (Upgrade) Rate***

The weighted downgrade (upgrade) rate is computed as the number of securities downgraded (upgraded), weighted by the number of total notches changed per downgrade (upgrade) per year, divided by the total number of outstanding securities at the beginning of the year, after excluding half of the ratings withdrawn during the year. For example, a security downgraded from Baa1 at the beginning of the year to Ba1 by the end of the year is counted as three downgrades in the calculation of a weighted downgrade rate, but counted as only one downgrade in the calculation of the unweighted downgrade rate.

### ***Downgrade (Upgrade) Rate by Broad Rating***

In calculating a downgrade (upgrade) rate by broad rating, a downgrade (upgrade) occurs only if the initial and end rating are in two different broad rating categories. For example, a rating change from Baa1 to Ba2 is considered a downgrade by broad rating, but a rating change from Baa1 to Baa3 is not. The latter case would still be considered to be a downgrade by refined rating, and therefore refined downgrade (upgrade) rates are always greater than or equal to broad downgrade (upgrade) rates.

### ***Cumulative (or Lifetime) Downgrade (Upgrade) Rate***

A security is considered to have experienced a cumulative or lifetime downgrade (upgrade), if its rating before withdrawal or rating at the end of the study period is lower (higher) than its original rating based on refined ratings. The cumulative downgrade (upgrade) rate for a particular group of securities is computed as the number of securities to experience a cumulative downgrade (upgrade) divided by the total number of securities in the group.

### ***Rating Stability Rate***

The rating stability rate is a measure of the proportion of ratings that were unchanged over the year. It is calculated as one minus the sum of the downgrade rate and upgrade rate.

### ***Withdrawal Rate***

The withdrawal rate is computed as the total number of ratings withdrawn by the end of the year divided by the total number of ratings outstanding at the beginning of the year.

### ***Rating Drift***

The rating drift is defined as the weighted upgrade rate minus the weighted downgrade rate.

### ***Rating Volatility***

The rating volatility is defined as the weighted upgrade rate plus the weighted downgrade rate.

### ***Downgrade-to-Upgrade Ratio (weighted, cumulative)***

The downgrade-to-upgrade ratio is calculated as the total number of downgraded ratings divided by the total number of upgraded ratings. The weighted downgrade-to-upgrade ratio, or downgrade-to-upgrade ratio weighted by the number of notches changed, computes the ratio of weighted downgrades to weighted upgrades. The cumulative downgrade-to-upgrade ratio is calculated as the number of ratings that have experienced a cumulative downgrade divided by the number of ratings that have experienced a cumulative upgrade.

### ***Cohort***

A cohort contains all rated securities outstanding at the beginning of a year regardless of when the security was issued. The length of a cohort is the number of years during which a security's rating will be examined. For example, a one-year cohort is formed for the purpose of examining rating changes over a one-year period. A three-year cohort is formed for the purpose of examining rating changes over a three-year period. Only the ratings outstanding at the beginning and end of the three-year period are used.

### ***Rating Transition Matrix***

A one-year rating transition matrix specifies the frequencies of ratings changed from a starting rating category at the beginning of a year to an end rating category at the end of a year (typically by broad rating). A multi-year rating transition matrix reports the frequencies of ratings changed from a starting rating category at the beginning of a multi-year cohort to an end rating category at the end of the multi-year cohort (typically by broad rating).

## ***ABS***

ABS stand for asset-backed securities. This structured finance sector includes securities backed by home equity loans (HEL) and both traditional asset types such as auto loans, credit card receivables, student loans, and manufactured housing loans, and non-traditional asset types such as mutual fund fees, tax liens, tobacco settlement payments, and intellectual property.

## ***HEL***

The home equity loan or HEL sector include securities back by subprime (B&C) mortgage loans, home improvement loans, high loan-to-value (high LTV) loans, home equity lines of credit (HELOCs), and closed-end second-lien loans, as well as net interest margin (NIM) securitizations. It does not include securities backed by Alt-A mortgages, which are included in the RMBS sector. HEL is part of the ABS sector.

## ***CDOs***

CDOs stand for collateralized debt obligations. Derivative securities such as structured notes, repackaged securities, and credit derivatives are not considered to be part of this sector.

## ***CMBS***

CMBS stand for commercial mortgage-backed securities.

## ***RMBS***

RMBS stand for residential mortgage-backed securities. The large majority of these securities are backed by first-lien prime mortgages, but some are backed by Alt-A mortgages. HEL is not considered to be part of this sector.

## ***Derivatives***

The derivatives sector contains structured notes, repackaged securities, and credit derivatives, as well as structured covered bonds, catastrophe-linked notes, and structured investment vehicles. This sector was denoted as “Others” in Moody’s first transition study in 2003.

## ***Global structured finance***

Global structured finance captures global structured securities in four major sectors: ABS, CDO, CMBS, and RMBS. The derivatives sector is excluded from this term to better summarize the rating transition experiences of core structured finance securities by removing the influence of securities that are wholly dependent on corporate credits.

## ***U.S. Structured Finance Securities***

U.S. structured finance securities are denominated in U.S. dollars and issued in the U.S. market.

## ***European Structured Finance Securities***

European structured finance securities are denominated in a European currency or issued in a European country.

## ***Asia-Pacific Structured Finance Securities***

Asia-Pacific structured finance securities are denominated in the currency of a country in the Asia-Pacific region or issued in an Asia-Pacific country (including Japan and Australia).

## ***Non-US Americas Structured Finance Securities***

Structured finance securities in the non-US Americas are denominated in Canadian dollars or a Latin American currency or issued in Canada or Latin America.

## Appendix II: Treatment of Withdrawn Ratings (WR)

The rating downgrade and upgrade rates reported in this study have been adjusted for withdrawn ratings by deducting half of the ratings withdrawn during the year from the total number of outstanding ratings at the beginning of the year.<sup>26</sup> This assumes that rating withdrawals occur uniformly over the course of the year. This treatment of withdrawn ratings is consistent with Moody's standard default rate calculations, which also typically remove half of the withdrawn ratings from the number of ratings outstanding at the beginning of each year.

In the Appendix to follow, transition matrices of all time horizons (unless otherwise noted) are displayed with a final column labeled WR that contains the proportion of ratings in the category that were withdrawn by the end of the time period. This presents a complete account of rating transitions. Below is an example of how to adjust these transition matrices for withdrawals, i.e. how to remove the WR column.

Figure 30a lists a sample row in a transition matrix with the WR column for the Aa rating category.

| Figure 30a – Sample Row from a Transition Matrix unadjusted for WR |       |        |       |       |       |       |              |       |
|--|-------|--------|-------|-------|-------|-------|--------------|-------|
|  | Aaa   | Aa     | A     | Baa   | Ba    | B     | Caa or below | WR    |
| Aa   | 5.62% | 84.36% | 1.90% | 0.62% | 0.16% | 0.09% | 0.12%        | 7.13% |

To adjust the transitions rates for downgrades and upgrades, take the original rate and divide by one minus half the rate in the WR column. For example, for transitions from Aa to Aaa, the adjusted rate is  $5.62\% / (1 - 7.13\%/2) = 5.82\%$ . The single-A, Baa, Ba, B, and Caa or below categories should be similarly adjusted. The adjusted transition rates for the aforementioned categories are displayed in Figure 30b.

| Figure 30b – Sample Row from a Transition Matrix adjusted for WR |       |        |       |       |       |       |              |
|--|-------|--------|-------|-------|-------|-------|--------------|
|  | Aaa   | Aa     | A     | Baa   | Ba    | B     | Caa or below |
| Aa   | 5.82% | 91.18% | 1.97% | 0.64% | 0.16% | 0.10% | 0.13%        |

The adjusted stability rate, which appears in the diagonal entries in the matrix, uses a different calculation and is computed as one minus the adjusted rates of all the other categories. In this example, the Aa column is calculated as  $1 - (5.82\% + 1.97\% + 0.64\% + 0.16\% + 0.10\% + 0.13\%) = 91.18\%$ .

To summarize, first calculate the adjusted non-diagonal entries of the matrix by taking the original rate and dividing by one minus half the withdrawal rate, and then compute the adjusted diagonal entries by subtracting the sum of the other adjusted entries in the same row from one.

26. In the structured finance transition studies published in 2003 and 2004, all withdrawn ratings were deducted from the population. However, the current method was adopted for the 2005 study and will be used for all future transition and default studies.



## Appendix III: Transition Matrices<sup>27</sup>

**Figure 31 – Global Structured Finance Rating Transition Matrices (1984-2005)**

| 1-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
|---------------|--------|--------|--------|--------|--------|--------|--------------|--------|
| Aaa           | 88.05% | 0.71%  | 0.18%  | 0.07%  | 0.02%  | 0.01%  | 0.03%        | 10.93% |
| Aa            | 5.62%  | 84.36% | 1.90%  | 0.62%  | 0.16%  | 0.09%  | 0.12%        | 7.13%  |
| A             | 1.22%  | 3.25%  | 85.30% | 1.81%  | 0.54%  | 0.20%  | 0.21%        | 7.46%  |
| Baa           | 0.38%  | 0.53%  | 2.80%  | 85.23% | 2.68%  | 1.09%  | 1.01%        | 6.28%  |
| Ba            | 0.10%  | 0.10%  | 0.49%  | 3.27%  | 82.56% | 3.41%  | 4.67%        | 5.40%  |
| B             | 0.06%  | 0.00%  | 0.11%  | 0.40%  | 2.02%  | 82.15% | 10.33%       | 4.92%  |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.07%  | 0.30%  | 90.73%       | 8.90%  |
| <b>2-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 74.84% | 1.17%  | 0.41%  | 0.19%  | 0.09%  | 0.07%  | 0.09%        | 23.13% |
| Aa            | 9.91%  | 68.64% | 3.13%  | 1.39%  | 0.45%  | 0.27%  | 0.46%        | 15.74% |
| A             | 2.65%  | 5.06%  | 70.16% | 2.72%  | 1.12%  | 0.52%  | 0.86%        | 16.92% |
| Baa           | 0.82%  | 1.28%  | 4.66%  | 69.49% | 3.94%  | 2.10%  | 3.27%        | 14.44% |
| Ba            | 0.20%  | 0.27%  | 1.46%  | 4.40%  | 66.74% | 4.59%  | 10.33%       | 12.00% |
| B             | 0.03%  | 0.00%  | 0.16%  | 0.86%  | 3.27%  | 67.83% | 16.87%       | 10.99% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.20%  | 0.60%  | 81.16%       | 18.04% |
| <b>3-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 62.33% | 1.35%  | 0.58%  | 0.31%  | 0.15%  | 0.12%  | 0.18%        | 34.98% |
| Aa            | 13.22% | 54.80% | 3.72%  | 2.03%  | 0.80%  | 0.54%  | 0.84%        | 24.05% |
| A             | 3.55%  | 5.88%  | 56.47% | 3.03%  | 1.37%  | 0.73%  | 1.68%        | 27.30% |
| Baa           | 1.14%  | 1.66%  | 5.55%  | 55.90% | 4.27%  | 2.92%  | 6.28%        | 22.29% |
| Ba            | 0.38%  | 0.47%  | 2.15%  | 5.23%  | 53.77% | 4.87%  | 14.48%       | 18.65% |
| B             | 0.07%  | 0.00%  | 0.22%  | 1.25%  | 3.01%  | 56.29% | 21.01%       | 18.14% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.32%  | 0.65%  | 71.59%       | 27.44% |
| <b>4-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 52.19% | 1.27%  | 0.60%  | 0.37%  | 0.17%  | 0.14%  | 0.26%        | 44.99% |
| Aa            | 15.97% | 43.62% | 3.86%  | 2.12%  | 0.92%  | 0.80%  | 1.15%        | 31.56% |
| A             | 4.24%  | 6.07%  | 45.86% | 2.42%  | 1.32%  | 0.73%  | 2.12%        | 37.24% |
| Baa           | 1.60%  | 1.88%  | 6.02%  | 46.39% | 4.27%  | 2.85%  | 8.57%        | 28.42% |
| Ba            | 0.51%  | 0.64%  | 2.38%  | 6.15%  | 43.27% | 4.53%  | 17.24%       | 25.26% |
| B             | 0.19%  | 0.00%  | 0.24%  | 1.75%  | 1.94%  | 47.21% | 22.97%       | 25.69% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.53%  | 0.80%  | 63.50%       | 35.16% |
| <b>5-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 43.70% | 1.07%  | 0.54%  | 0.36%  | 0.13%  | 0.14%  | 0.23%        | 53.83% |
| Aa            | 18.39% | 34.68% | 3.47%  | 1.90%  | 0.76%  | 0.85%  | 1.30%        | 38.64% |
| A             | 5.22%  | 6.11%  | 36.31% | 1.78%  | 1.01%  | 0.64%  | 2.05%        | 46.88% |
| Baa           | 2.20%  | 2.33%  | 6.86%  | 38.74% | 3.62%  | 2.71%  | 10.00%       | 33.54% |
| Ba            | 0.67%  | 0.98%  | 3.15%  | 7.28%  | 34.84% | 3.64%  | 16.42%       | 33.02% |
| B             | 0.32%  | 0.00%  | 0.26%  | 2.34%  | 1.75%  | 39.35% | 22.21%       | 33.77% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.75%  | 0.93%  | 57.28%       | 41.04% |

27. Almost all the transition matrices presented in this section are unadjusted for withdrawn ratings. See Appendix II for directions on how to adjust these matrices for withdrawals.

**Figure 32 – US ABS Rating Transition Matrices (1984-2005)**

| <b>1-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa or below</b> | <b>WR</b> |
|---------------|------------|-----------|----------|------------|-----------|----------|---------------------|-----------|
| Aaa           | 86.62%     | 0.76%     | 0.25%    | 0.12%      | 0.05%     | 0.04%    | 0.08%               | 12.08%    |
| Aa            | 2.70%      | 87.50%    | 1.91%    | 0.88%      | 0.34%     | 0.19%    | 0.40%               | 6.09%     |
| A             | 0.78%      | 1.39%     | 86.80%   | 1.75%      | 0.71%     | 0.32%    | 0.28%               | 7.97%     |
| Baa           | 0.30%      | 0.34%     | 0.95%    | 87.41%     | 3.26%     | 1.30%    | 1.41%               | 5.04%     |
| Ba            | 0.27%      | 0.21%     | 0.21%    | 3.74%      | 74.01%    | 5.39%    | 11.58%              | 4.59%     |
| B             | 0.00%      | 0.00%     | 0.15%    | 0.46%      | 0.46%     | 70.62%   | 25.69%              | 2.62%     |
| Caa or below  | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 0.19%    | 90.98%              | 8.83%     |
| <b>2-year</b> |            |           |          |            |           |          |                     |           |
| Aaa           | 71.54%     | 1.22%     | 0.55%    | 0.31%      | 0.21%     | 0.17%    | 0.21%               | 25.80%    |
| Aa            | 4.77%      | 72.88%    | 3.05%    | 2.04%      | 0.93%     | 0.68%    | 1.49%               | 14.16%    |
| A             | 1.57%      | 2.28%     | 72.09%   | 2.66%      | 1.16%     | 0.78%    | 1.27%               | 18.19%    |
| Baa           | 0.71%      | 0.75%     | 1.60%    | 72.59%     | 4.99%     | 2.65%    | 4.65%               | 12.06%    |
| Ba            | 0.48%      | 0.48%     | 0.48%    | 1.31%      | 55.27%    | 5.38%    | 25.78%              | 10.82%    |
| B             | 0.20%      | 0.00%     | 0.40%    | 0.99%      | 0.79%     | 52.58%   | 36.90%              | 8.13%     |
| Caa or below  | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 0.52%    | 77.00%              | 22.47%    |
| <b>3-year</b> |            |           |          |            |           |          |                     |           |
| Aaa           | 56.33%     | 1.25%     | 0.67%    | 0.51%      | 0.32%     | 0.27%    | 0.37%               | 40.28%    |
| Aa            | 6.60%      | 59.18%    | 3.73%    | 2.69%      | 1.21%     | 1.46%    | 2.69%               | 22.44%    |
| A             | 1.83%      | 2.41%     | 58.24%   | 3.00%      | 1.38%     | 0.90%    | 2.34%               | 29.89%    |
| Baa           | 0.80%      | 0.90%     | 2.08%    | 57.66%     | 5.58%     | 3.88%    | 9.01%               | 20.08%    |
| Ba            | 0.79%      | 0.79%     | 0.70%    | 1.40%      | 43.80%    | 4.45%    | 31.94%              | 16.14%    |
| B             | 0.56%      | 0.00%     | 0.84%    | 1.40%      | 1.40%     | 41.57%   | 38.48%              | 15.73%    |
| Caa or below  | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 0.75%    | 56.72%              | 42.54%    |
| <b>4-year</b> |            |           |          |            |           |          |                     |           |
| Aaa           | 43.29%     | 1.03%     | 0.69%    | 0.60%      | 0.33%     | 0.27%    | 0.48%               | 53.31%    |
| Aa            | 7.28%      | 48.68%    | 3.94%    | 2.38%      | 1.27%     | 2.32%    | 3.27%               | 30.85%    |
| A             | 1.99%      | 1.99%     | 47.70%   | 2.27%      | 1.31%     | 0.74%    | 2.70%               | 41.31%    |
| Baa           | 0.86%      | 1.02%     | 2.05%    | 46.97%     | 6.88%     | 4.03%    | 11.59%              | 26.58%    |
| Ba            | 1.04%      | 1.04%     | 0.93%    | 1.50%      | 29.98%    | 4.63%    | 38.77%              | 22.11%    |
| B             | 1.57%      | 0.00%     | 1.18%    | 1.97%      | 1.97%     | 34.25%   | 31.89%              | 27.17%    |
| Caa or below  | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 0.00%    | 34.86%              | 65.14%    |
| <b>5-year</b> |            |           |          |            |           |          |                     |           |
| Aaa           | 32.04%     | 0.88%     | 0.69%    | 0.61%      | 0.29%     | 0.25%    | 0.37%               | 64.87%    |
| Aa            | 7.94%      | 40.52%    | 3.50%    | 2.06%      | 0.99%     | 2.92%    | 3.17%               | 38.91%    |
| A             | 2.28%      | 1.71%     | 37.93%   | 1.61%      | 0.93%     | 0.61%    | 2.54%               | 52.38%    |
| Baa           | 1.04%      | 1.21%     | 1.98%    | 38.96%     | 6.43%     | 3.93%    | 14.88%              | 31.58%    |
| Ba            | 1.31%      | 1.15%     | 0.98%    | 1.31%      | 25.04%    | 3.93%    | 36.50%              | 29.79%    |
| B             | 2.69%      | 0.00%     | 1.08%    | 2.69%      | 2.15%     | 29.03%   | 24.73%              | 37.63%    |
| Caa or below  | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 0.00%    | 31.03%              | 68.97%    |

**Figure 33 – US HEL Rating Transition Matrices (1990-2005)**

| <b>1-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa or below</b> | <b>WR</b> |
|---------------|------------|-----------|----------|------------|-----------|----------|---------------------|-----------|
| Aaa           | 91.34%     | 0.13%     | 0.00%    | 0.00%      | 0.03%     | 0.00%    | 0.00%               | 8.51%     |
| Aa            | 2.49%      | 91.84%    | 0.55%    | 0.03%      | 0.03%     | 0.03%    | 0.00%               | 5.04%     |
| A             | 0.43%      | 1.85%     | 92.67%   | 1.17%      | 0.34%     | 0.02%    | 0.05%               | 3.47%     |
| Baa           | 0.04%      | 0.17%     | 0.73%    | 91.98%     | 1.85%     | 0.66%    | 0.60%               | 3.97%     |
| Ba            | 0.00%      | 0.24%     | 0.36%    | 2.80%      | 85.89%    | 2.55%    | 4.50%               | 3.65%     |
| B             | 0.00%      | 0.00%     | 0.37%    | 0.74%      | 1.10%     | 82.72%   | 11.40%              | 3.68%     |
| Caa or below  | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 0.00%    | 81.12%              | 18.88%    |
| <b>2-year</b> |            |           |          |            |           |          |                     |           |
| Aaa           | 80.13%     | 0.33%     | 0.00%    | 0.00%      | 0.04%     | 0.00%    | 0.00%               | 19.50%    |
| Aa            | 5.25%      | 80.39%    | 1.19%    | 0.17%      | 0.08%     | 0.04%    | 0.00%               | 12.88%    |
| A             | 1.00%      | 4.05%     | 81.30%   | 2.82%      | 1.00%     | 0.23%    | 0.19%               | 9.41%     |
| Baa           | 0.14%      | 0.36%     | 1.71%    | 79.61%     | 3.78%     | 1.68%    | 2.11%               | 10.60%    |
| Ba            | 0.17%      | 0.52%     | 0.87%    | 1.56%      | 71.01%    | 3.99%    | 11.46%              | 10.42%    |
| B             | 0.44%      | 0.00%     | 0.88%    | 1.32%      | 1.76%     | 70.93%   | 13.66%              | 11.01%    |
| Caa or below  | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 0.00%    | 62.07%              | 37.93%    |
| <b>3-year</b> |            |           |          |            |           |          |                     |           |
| Aaa           | 68.30%     | 0.37%     | 0.05%    | 0.00%      | 0.05%     | 0.00%    | 0.00%               | 31.22%    |
| Aa            | 7.82%      | 67.92%    | 2.06%    | 0.38%      | 0.19%     | 0.06%    | 0.00%               | 21.58%    |
| A             | 2.06%      | 6.07%     | 67.37%   | 4.59%      | 1.65%     | 0.53%    | 0.59%               | 17.14%    |
| Baa           | 0.36%      | 0.71%     | 3.27%    | 64.11%     | 6.30%     | 3.39%    | 4.52%               | 17.35%    |
| Ba            | 0.44%      | 0.88%     | 1.32%    | 2.20%      | 58.37%    | 4.63%    | 16.74%              | 15.42%    |
| B             | 1.05%      | 0.00%     | 1.58%    | 2.11%      | 2.63%     | 56.84%   | 16.32%              | 19.47%    |
| Caa or below  | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 0.00%    | 37.78%              | 62.22%    |
| <b>4-year</b> |            |           |          |            |           |          |                     |           |
| Aaa           | 59.91%     | 0.38%     | 0.08%    | 0.00%      | 0.00%     | 0.00%    | 0.00%               | 39.64%    |
| Aa            | 8.19%      | 57.64%    | 2.51%    | 0.56%      | 0.28%     | 0.00%    | 0.00%               | 30.82%    |
| A             | 3.04%      | 6.25%     | 56.42%   | 5.03%      | 2.52%     | 0.87%    | 0.87%               | 25.00%    |
| Baa           | 0.57%      | 1.04%     | 4.06%    | 51.98%     | 8.03%     | 4.44%    | 6.99%               | 22.87%    |
| Ba            | 1.18%      | 1.18%     | 2.06%    | 2.65%      | 45.88%    | 5.29%    | 20.00%              | 21.76%    |
| B             | 2.60%      | 0.00%     | 1.95%    | 3.25%      | 3.25%     | 45.45%   | 16.23%              | 27.27%    |
| Caa or below  | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 0.00%    | 17.24%              | 82.76%    |
| <b>5-year</b> |            |           |          |            |           |          |                     |           |
| Aaa           | 51.05%     | 0.31%     | 0.00%    | 0.00%      | 0.00%     | 0.00%    | 0.00%               | 48.64%    |
| Aa            | 9.04%      | 47.12%    | 2.33%    | 0.82%      | 0.27%     | 0.00%    | 0.00%               | 40.41%    |
| A             | 4.05%      | 6.33%     | 46.84%   | 5.06%      | 1.90%     | 1.39%    | 1.52%               | 32.91%    |
| Baa           | 0.71%      | 1.42%     | 4.55%    | 41.82%     | 8.82%     | 4.84%    | 9.39%               | 28.45%    |
| Ba            | 1.72%      | 0.86%     | 2.58%    | 1.72%      | 38.63%    | 6.01%    | 18.88%              | 29.61%    |
| B             | 4.20%      | 0.00%     | 1.68%    | 4.20%      | 3.36%     | 36.13%   | 14.29%              | 36.13%    |
| Caa or below  | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 0.00%    | 14.29%              | 85.71%    |

**Figure 34 – US ABS (excl. MH and HEL) Rating Transition Matrices (1984-2005)**

| 1-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
|---------------|--------|--------|--------|--------|--------|--------|--------------|--------|
| Aaa           | 85.08% | 0.71%  | 0.10%  | 0.09%  | 0.01%  | 0.01%  | 0.10%        | 13.89% |
| Aa            | 2.32%  | 80.38% | 3.23%  | 1.67%  | 0.54%  | 0.11%  | 0.65%        | 11.11% |
| A             | 0.86%  | 1.14%  | 84.33% | 1.96%  | 0.59%  | 0.16%  | 0.14%        | 10.82% |
| Baa           | 0.91%  | 0.63%  | 1.45%  | 80.45% | 3.63%  | 1.68%  | 1.41%        | 9.84%  |
| Ba            | 0.77%  | 0.00%  | 0.15%  | 1.39%  | 70.90% | 7.89%  | 10.22%       | 8.67%  |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.47%  | 0.00%  | 63.38% | 33.33%       | 2.82%  |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.48%  | 84.89%       | 14.63% |
| <b>2-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 69.42% | 0.99%  | 0.28%  | 0.19%  | 0.08%  | 0.04%  | 0.22%        | 28.77% |
| Aa            | 1.97%  | 62.65% | 4.12%  | 4.06%  | 1.52%  | 0.25%  | 1.59%        | 23.84% |
| A             | 1.52%  | 1.54%  | 69.72% | 2.48%  | 0.91%  | 0.60%  | 0.77%        | 22.47% |
| Baa           | 1.80%  | 1.29%  | 1.57%  | 62.58% | 4.10%  | 2.92%  | 4.44%        | 21.29% |
| Ba            | 1.20%  | 0.00%  | 0.40%  | 1.20%  | 50.90% | 6.01%  | 20.84%       | 19.44% |
| B             | 0.00%  | 0.00%  | 0.00%  | 1.27%  | 0.00%  | 42.68% | 46.50%       | 9.55%  |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 1.17%  | 64.45%       | 34.38% |
| <b>3-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 53.59% | 0.89%  | 0.36%  | 0.31%  | 0.13%  | 0.09%  | 0.32%        | 44.32% |
| Aa            | 1.83%  | 46.81% | 4.26%  | 4.99%  | 2.13%  | 1.10%  | 2.57%        | 36.32% |
| A             | 1.30%  | 1.25%  | 56.58% | 2.50%  | 1.12%  | 0.68%  | 1.46%        | 35.10% |
| Baa           | 1.31%  | 0.87%  | 1.09%  | 47.16% | 2.48%  | 3.06%  | 7.29%        | 36.73% |
| Ba            | 1.91%  | 0.00%  | 0.55%  | 0.27%  | 36.89% | 4.92%  | 24.59%       | 30.87% |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.99%  | 0.00%  | 31.68% | 48.51%       | 18.81% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 1.46%  | 40.88%       | 57.66% |
| <b>4-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 39.62% | 0.55%  | 0.39%  | 0.34%  | 0.24%  | 0.07%  | 0.34%        | 58.46% |
| Aa            | 1.32%  | 36.44% | 3.51%  | 3.42%  | 2.02%  | 1.84%  | 2.99%        | 48.46% |
| A             | 0.97%  | 0.88%  | 46.39% | 1.55%  | 0.88%  | 0.52%  | 1.83%        | 46.97% |
| Baa           | 0.66%  | 0.47%  | 0.57%  | 36.43% | 2.18%  | 2.28%  | 8.16%        | 49.24% |
| Ba            | 1.93%  | 0.00%  | 0.39%  | 0.00%  | 22.78% | 5.79%  | 24.71%       | 44.40% |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 24.24% | 34.85%       | 40.91% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 18.00%       | 82.00% |
| <b>5-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 28.03% | 0.40%  | 0.25%  | 0.26%  | 0.23%  | 0.07%  | 0.28%        | 70.48% |
| Aa            | 1.30%  | 30.55% | 2.82%  | 2.17%  | 0.98%  | 1.63%  | 2.71%        | 57.85% |
| A             | 0.80%  | 0.77%  | 36.68% | 0.88%  | 0.67%  | 0.35%  | 1.55%        | 58.31% |
| Baa           | 0.52%  | 0.13%  | 0.26%  | 28.90% | 1.81%  | 1.55%  | 8.00%        | 58.84% |
| Ba            | 2.14%  | 0.00%  | 0.00%  | 0.00%  | 16.58% | 4.28%  | 17.11%       | 59.89% |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 25.58% | 16.28%       | 58.14% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 7.69%        | 92.31% |

**Figure 35 – US CDO Rating Transition Matrices (1991-2005)**

| 1-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
|---------------|--------|--------|--------|--------|--------|--------|--------------|--------|
| Aaa           | 90.34% | 2.23%  | 0.72%  | 0.36%  | 0.08%  | 0.00%  | 0.00%        | 6.28%  |
| Aa            | 0.90%  | 86.19% | 4.20%  | 2.10%  | 0.65%  | 0.25%  | 0.15%        | 5.56%  |
| A             | 0.32%  | 1.17%  | 87.07% | 2.97%  | 1.22%  | 0.42%  | 0.64%        | 6.20%  |
| Baa           | 0.00%  | 0.11%  | 0.51%  | 84.52% | 4.33%  | 2.89%  | 2.27%        | 5.38%  |
| Ba            | 0.00%  | 0.07%  | 0.00%  | 0.34%  | 82.19% | 4.60%  | 7.79%        | 5.01%  |
| B             | 0.00%  | 0.00%  | 0.18%  | 0.00%  | 1.29%  | 73.01% | 21.63%       | 3.88%  |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.14%  | 0.00%  | 95.16%       | 4.70%  |
| <b>2-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 78.74% | 4.59%  | 2.24%  | 0.98%  | 0.33%  | 0.16%  | 0.05%        | 12.90% |
| Aa            | 1.45%  | 71.28% | 7.25%  | 4.74%  | 1.91%  | 1.05%  | 0.66%        | 11.66% |
| A             | 0.61%  | 2.05%  | 72.42% | 4.47%  | 2.88%  | 1.36%  | 2.27%        | 13.94% |
| Baa           | 0.00%  | 0.28%  | 0.84%  | 67.15% | 7.17%  | 5.25%  | 8.11%        | 11.20% |
| Ba            | 0.00%  | 0.09%  | 0.00%  | 0.88%  | 64.17% | 7.15%  | 18.18%       | 9.53%  |
| B             | 0.00%  | 0.00%  | 0.23%  | 0.00%  | 2.09%  | 55.35% | 34.19%       | 8.14%  |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.22%  | 0.00%  | 90.09%       | 9.70%  |
| <b>3-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 64.44% | 7.51%  | 4.14%  | 1.84%  | 0.61%  | 0.54%  | 0.08%        | 20.84% |
| Aa            | 1.32%  | 55.33% | 9.69%  | 8.19%  | 4.05%  | 1.85%  | 1.67%        | 17.89% |
| A             | 0.44%  | 2.43%  | 54.70% | 5.52%  | 4.53%  | 2.54%  | 5.19%        | 24.64% |
| Baa           | 0.06%  | 0.31%  | 0.67%  | 48.47% | 8.65%  | 7.79%  | 16.13%       | 17.91% |
| Ba            | 0.00%  | 0.00%  | 0.00%  | 1.20%  | 45.92% | 8.15%  | 30.46%       | 14.27% |
| B             | 0.00%  | 0.00%  | 0.31%  | 0.00%  | 1.55%  | 38.82% | 46.27%       | 13.04% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 84.35%       | 15.65% |
| <b>4-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 50.29% | 8.57%  | 5.14%  | 2.86%  | 0.91%  | 1.14%  | 0.11%        | 30.97% |
| Aa            | 1.19%  | 41.31% | 10.12% | 10.12% | 5.95%  | 2.62%  | 3.45%        | 25.24% |
| A             | 0.17%  | 2.67%  | 38.40% | 3.84%  | 5.01%  | 3.51%  | 8.18%        | 38.23% |
| Baa           | 0.09%  | 0.17%  | 0.43%  | 34.16% | 7.67%  | 7.50%  | 24.19%       | 25.81% |
| Ba            | 0.00%  | 0.00%  | 0.00%  | 1.43%  | 33.33% | 6.60%  | 37.43%       | 21.21% |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.41%  | 29.10% | 52.87%       | 17.62% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 87.04%       | 12.96% |
| <b>5-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 38.93% | 6.87%  | 3.82%  | 3.24%  | 0.95%  | 1.15%  | 0.19%        | 44.85% |
| Aa            | 1.35%  | 32.09% | 10.47% | 9.12%  | 6.25%  | 2.03%  | 4.73%        | 33.95% |
| A             | 0.00%  | 3.21%  | 27.01% | 1.87%  | 3.74%  | 3.74%  | 7.75%        | 52.67% |
| Baa           | 0.13%  | 0.26%  | 0.38%  | 24.11% | 7.14%  | 7.14%  | 26.66%       | 34.18% |
| Ba            | 0.00%  | 0.00%  | 0.31%  | 1.53%  | 23.31% | 4.60%  | 40.49%       | 29.75% |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.59%  | 21.76% | 56.47%       | 21.18% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 85.71%       | 14.29% |

**Figure 36 – US CDO (excl. HY CBOs) Rating Transition Matrices (1991-2005)**

| 1-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
|---------------|--------|--------|--------|--------|--------|--------|--------------|--------|
| Aaa           | 91.11% | 1.45%  | 0.45%  | 0.15%  | 0.05%  | 0.00%  | 0.00%        | 6.79%  |
| Aa            | 0.69%  | 88.06% | 3.14%  | 1.13%  | 0.38%  | 0.13%  | 0.13%        | 6.35%  |
| A             | 0.25%  | 0.86%  | 88.82% | 2.04%  | 0.74%  | 0.31%  | 0.43%        | 6.55%  |
| Baa           | 0.00%  | 0.10%  | 0.39%  | 87.26% | 2.56%  | 2.12%  | 1.50%        | 6.08%  |
| Ba            | 0.00%  | 0.00%  | 0.00%  | 0.49%  | 86.55% | 2.92%  | 3.90%        | 6.14%  |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.75%  | 74.44% | 18.80%       | 6.02%  |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 88.83%       | 11.17% |
| <b>2-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 80.84% | 2.60%  | 1.37%  | 0.51%  | 0.22%  | 0.07%  | 0.07%        | 14.32% |
| Aa            | 1.13%  | 75.65% | 5.57%  | 2.00%  | 0.78%  | 0.70%  | 0.35%        | 13.83% |
| A             | 0.45%  | 1.91%  | 75.55% | 3.00%  | 1.73%  | 0.91%  | 1.45%        | 15.00% |
| Baa           | 0.00%  | 0.20%  | 0.73%  | 72.77% | 4.56%  | 3.44%  | 5.09%        | 13.22% |
| Ba            | 0.00%  | 0.00%  | 0.00%  | 1.34%  | 72.90% | 4.14%  | 9.35%        | 12.28% |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.99%  | 64.36% | 22.28%       | 12.38% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 73.55%       | 26.45% |
| <b>3-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 67.64% | 4.42%  | 2.37%  | 0.86%  | 0.32%  | 0.22%  | 0.11%        | 24.06% |
| Aa            | 1.36%  | 62.62% | 7.80%  | 3.22%  | 1.49%  | 1.11%  | 0.50%        | 21.91% |
| A             | 0.41%  | 2.44%  | 58.40% | 3.93%  | 2.71%  | 1.36%  | 3.12%        | 27.64% |
| Baa           | 0.00%  | 0.18%  | 0.64%  | 56.07% | 6.21%  | 5.48%  | 9.13%        | 22.28% |
| Ba            | 0.00%  | 0.00%  | 0.00%  | 1.94%  | 57.95% | 4.65%  | 15.50%       | 19.96% |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.68%  | 55.10% | 23.81%       | 20.41% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 52.63%       | 47.37% |
| <b>4-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 52.33% | 4.84%  | 2.94%  | 1.38%  | 0.52%  | 0.35%  | 0.17%        | 37.48% |
| Aa            | 1.61%  | 50.81% | 7.51%  | 3.22%  | 2.15%  | 1.25%  | 0.72%        | 32.74% |
| A             | 0.21%  | 2.71%  | 41.25% | 3.33%  | 2.50%  | 1.67%  | 4.38%        | 43.96% |
| Baa           | 0.00%  | 0.13%  | 0.40%  | 42.11% | 6.15%  | 5.08%  | 12.17%       | 33.96% |
| Ba            | 0.00%  | 0.00%  | 0.00%  | 2.48%  | 44.89% | 4.64%  | 15.79%       | 32.20% |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.92%  | 47.71% | 22.02%       | 29.36% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 61.54%       | 38.46% |
| <b>5-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 39.41% | 2.65%  | 1.47%  | 1.18%  | 0.29%  | 0.29%  | 0.29%        | 54.41% |
| Aa            | 1.85%  | 42.74% | 6.86%  | 1.85%  | 0.79%  | 0.26%  | 0.53%        | 45.12% |
| A             | 0.00%  | 2.91%  | 29.45% | 1.29%  | 1.29%  | 1.62%  | 2.91%        | 60.52% |
| Baa           | 0.00%  | 0.21%  | 0.21%  | 31.83% | 6.78%  | 5.34%  | 9.45%        | 46.20% |
| Ba            | 0.00%  | 0.00%  | 0.52%  | 2.62%  | 31.41% | 4.19%  | 16.23%       | 45.03% |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 1.43%  | 38.57% | 21.43%       | 38.57% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 75.00%       | 25.00% |

**Figure 37 – US CMBS Rating Transition Matrices (1988-2005)**

| <b>1-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa or below</b> | <b>WR</b> |
|---------------|------------|-----------|----------|------------|-----------|----------|---------------------|-----------|
| Aaa           | 87.95%     | 1.03%     | 0.00%    | 0.00%      | 0.00%     | 0.00%    | 0.00%               | 11.02%    |
| Aa            | 10.76%     | 80.53%    | 0.73%    | 0.08%      | 0.00%     | 0.08%    | 0.04%               | 7.77%     |
| A             | 2.45%      | 6.52%     | 84.25%   | 1.23%      | 0.04%     | 0.00%    | 0.00%               | 5.52%     |
| Baa           | 0.69%      | 0.98%     | 4.65%    | 83.15%     | 2.18%     | 0.26%    | 0.08%               | 8.01%     |
| Ba            | 0.05%      | 0.05%     | 0.28%    | 2.28%      | 89.99%    | 2.89%    | 0.28%               | 4.19%     |
| B             | 0.16%      | 0.00%     | 0.05%    | 0.32%      | 0.74%     | 89.70%   | 6.37%               | 2.65%     |
| Caa or below  | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 0.70%    | 90.53%              | 8.77%     |
| <b>2-year</b> |            |           |          |            |           |          |                     |           |
| Aaa           | 77.69%     | 1.72%     | 0.17%    | 0.00%      | 0.00%     | 0.00%    | 0.00%               | 20.41%    |
| Aa            | 17.10%     | 63.79%    | 1.23%    | 0.21%      | 0.10%     | 0.05%    | 0.10%               | 17.41%    |
| A             | 4.24%      | 10.34%    | 70.28%   | 1.86%      | 0.47%     | 0.00%    | 0.05%               | 12.76%    |
| Baa           | 1.33%      | 1.85%     | 7.75%    | 66.74%     | 3.14%     | 0.62%    | 0.13%               | 18.44%    |
| Ba            | 0.06%      | 0.32%     | 0.57%    | 3.94%      | 80.30%    | 5.40%    | 0.89%               | 8.51%     |
| B             | 0.00%      | 0.00%     | 0.07%    | 0.71%      | 1.21%     | 78.76%   | 13.42%              | 5.82%     |
| Caa or below  | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 1.64%    | 81.42%              | 16.94%    |
| <b>3-year</b> |            |           |          |            |           |          |                     |           |
| Aaa           | 68.61%     | 1.84%     | 0.44%    | 0.00%      | 0.00%     | 0.00%    | 0.00%               | 29.11%    |
| Aa            | 21.02%     | 50.69%    | 1.44%    | 0.33%      | 0.26%     | 0.07%    | 0.26%               | 25.93%    |
| A             | 5.74%      | 12.59%    | 59.20%   | 2.16%      | 0.93%     | 0.00%    | 0.00%               | 19.38%    |
| Baa           | 1.65%      | 2.51%     | 9.79%    | 56.76%     | 3.29%     | 0.69%    | 0.22%               | 25.09%    |
| Ba            | 0.09%      | 0.82%     | 0.45%    | 5.07%      | 70.47%    | 7.61%    | 1.81%               | 13.68%    |
| B             | 0.00%      | 0.00%     | 0.20%    | 0.79%      | 1.28%     | 67.65%   | 19.63%              | 10.45%    |
| Caa or below  | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 2.50%    | 78.33%              | 19.17%    |
| <b>4-year</b> |            |           |          |            |           |          |                     |           |
| Aaa           | 60.38%     | 1.92%     | 0.87%    | 0.00%      | 0.00%     | 0.00%    | 0.00%               | 36.83%    |
| Aa            | 24.21%     | 38.36%    | 1.19%    | 0.34%      | 0.51%     | 0.00%    | 0.34%               | 35.04%    |
| A             | 7.56%      | 14.53%    | 48.34%   | 2.12%      | 1.02%     | 0.00%    | 0.00%               | 26.42%    |
| Baa           | 2.75%      | 3.07%     | 11.95%   | 49.19%     | 3.00%     | 0.50%    | 0.31%               | 29.22%    |
| Ba            | 0.00%      | 1.24%     | 0.41%    | 5.92%      | 59.09%    | 9.37%    | 3.03%               | 20.94%    |
| B             | 0.00%      | 0.00%     | 0.29%    | 1.16%      | 1.74%     | 54.80%   | 25.00%              | 17.01%    |
| Caa or below  | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 3.80%    | 77.22%              | 18.99%    |
| <b>5-year</b> |            |           |          |            |           |          |                     |           |
| Aaa           | 53.07%     | 1.87%     | 1.20%    | 0.13%      | 0.00%     | 0.00%    | 0.00%               | 43.72%    |
| Aa            | 27.96%     | 25.95%    | 1.34%    | 0.22%      | 0.67%     | 0.00%    | 0.45%               | 43.40%    |
| A             | 10.42%     | 17.28%    | 36.76%   | 1.72%      | 0.86%     | 0.00%    | 0.00%               | 32.97%    |
| Baa           | 4.32%      | 4.41%     | 15.36%   | 41.07%     | 2.30%     | 0.48%    | 0.48%               | 31.57%    |
| Ba            | 0.00%      | 2.32%     | 0.63%    | 6.96%      | 46.41%    | 8.86%    | 3.80%               | 31.01%    |
| B             | 0.00%      | 0.00%     | 0.44%    | 1.55%      | 2.21%     | 43.81%   | 25.66%              | 26.33%    |
| Caa or below  | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 5.36%    | 69.64%              | 25.00%    |

**Figure 38 – US RMBS Rating Transition Matrices (1984-2005)**

| 1-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
|---------------|--------|--------|--------|--------|--------|--------|--------------|--------|
| Aaa           | 88.75% | 0.34%  | 0.09%  | 0.02%  | 0.00%  | 0.00%  | 0.00%        | 10.81% |
| Aa            | 7.62%  | 83.16% | 1.60%  | 0.34%  | 0.01%  | 0.03%  | 0.01%        | 7.23%  |
| A             | 1.87%  | 6.23%  | 82.13% | 1.57%  | 0.19%  | 0.04%  | 0.17%        | 7.80%  |
| Baa           | 0.49%  | 0.79%  | 5.26%  | 83.67% | 1.40%  | 0.73%  | 0.71%        | 6.96%  |
| Ba            | 0.12%  | 0.12%  | 1.25%  | 5.60%  | 83.02% | 1.37%  | 2.28%        | 6.23%  |
| B             | 0.00%  | 0.00%  | 0.07%  | 0.56%  | 4.21%  | 83.57% | 4.42%        | 7.16%  |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.13%  | 0.00%  | 87.70%       | 12.17% |
| <b>2-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 76.15% | 0.60%  | 0.18%  | 0.05%  | 0.00%  | 0.00%  | 0.04%        | 22.97% |
| Aa            | 13.46% | 67.01% | 2.84%  | 0.88%  | 0.09%  | 0.03%  | 0.07%        | 15.62% |
| A             | 5.19%  | 8.97%  | 64.49% | 2.16%  | 0.76%  | 0.20%  | 0.38%        | 17.85% |
| Baa           | 1.16%  | 2.30%  | 7.83%  | 67.65% | 1.71%  | 1.40%  | 2.02%        | 15.91% |
| Ba            | 0.29%  | 0.29%  | 3.84%  | 8.94%  | 66.05% | 1.55%  | 4.32%        | 14.72% |
| B             | 0.00%  | 0.00%  | 0.08%  | 1.24%  | 6.37%  | 67.74% | 6.62%        | 17.95% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.30%  | 0.00%  | 79.79%       | 19.91% |
| <b>3-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 65.71% | 0.75%  | 0.26%  | 0.09%  | 0.01%  | 0.00%  | 0.10%        | 33.08% |
| Aa            | 17.50% | 53.51% | 3.48%  | 1.33%  | 0.33%  | 0.11%  | 0.14%        | 23.62% |
| A             | 7.37%  | 10.05% | 51.52% | 2.34%  | 0.68%  | 0.52%  | 0.83%        | 26.69% |
| Baa           | 1.85%  | 2.84%  | 8.34%  | 56.39% | 1.57%  | 1.60%  | 3.85%        | 23.55% |
| Ba            | 0.51%  | 0.34%  | 5.43%  | 9.78%  | 54.55% | 1.53%  | 5.43%        | 22.44% |
| B             | 0.00%  | 0.00%  | 0.00%  | 1.87%  | 5.03%  | 57.20% | 8.38%        | 27.51% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.52%  | 0.00%  | 72.73%       | 26.75% |
| <b>4-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 58.27% | 0.87%  | 0.27%  | 0.08%  | 0.03%  | 0.01%  | 0.17%        | 40.30% |
| Aa            | 20.54% | 42.68% | 3.79%  | 1.55%  | 0.37%  | 0.24%  | 0.37%        | 30.47% |
| A             | 8.67%  | 10.56% | 42.89% | 2.35%  | 0.67%  | 0.58%  | 1.10%        | 33.18% |
| Baa           | 2.54%  | 2.93%  | 8.63%  | 49.69% | 1.31%  | 1.46%  | 5.20%        | 28.23% |
| Ba            | 0.67%  | 0.40%  | 5.21%  | 10.69% | 47.70% | 1.54%  | 6.15%        | 27.66% |
| B             | 0.00%  | 0.00%  | 0.00%  | 2.64%  | 2.16%  | 51.32% | 10.22%       | 33.65% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.82%  | 0.00%  | 65.57%       | 33.61% |
| <b>5-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 51.58% | 0.88%  | 0.29%  | 0.11%  | 0.01%  | 0.04%  | 0.18%        | 46.92% |
| Aa            | 22.64% | 33.98% | 3.34%  | 1.59%  | 0.33%  | 0.29%  | 0.66%        | 37.17% |
| A             | 10.03% | 10.31% | 34.82% | 2.23%  | 0.70%  | 0.52%  | 1.43%        | 39.97% |
| Baa           | 3.16%  | 3.23%  | 9.48%  | 42.49% | 1.00%  | 1.58%  | 6.18%        | 32.88% |
| Ba            | 0.77%  | 0.69%  | 6.00%  | 11.62% | 39.38% | 1.38%  | 7.15%        | 33.00% |
| B             | 0.00%  | 0.00%  | 0.00%  | 3.24%  | 1.41%  | 44.08% | 11.55%       | 39.72% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 1.01%  | 0.00%  | 58.73%       | 40.25% |



**Figure 39 – One-Year Rating Transition Matrices by Sector (1996-2005)**

| Global Structured Finance    | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
|------------------------------|--------|--------|--------|--------|--------|--------|--------------|--------|
| Aaa                          | 87.65% | 0.58%  | 0.19%  | 0.08%  | 0.03%  | 0.02%  | 0.03%        | 11.43% |
| Aa                           | 5.54%  | 83.88% | 1.63%  | 0.65%  | 0.19%  | 0.10%  | 0.15%        | 7.87%  |
| A                            | 1.24%  | 3.11%  | 85.22% | 1.70%  | 0.57%  | 0.21%  | 0.22%        | 7.73%  |
| Baa                          | 0.40%  | 0.54%  | 2.81%  | 85.08% | 2.60%  | 1.08%  | 1.02%        | 6.47%  |
| Ba                           | 0.08%  | 0.10%  | 0.50%  | 3.30%  | 82.52% | 3.33%  | 4.71%        | 5.46%  |
| B                            | 0.06%  | 0.00%  | 0.11%  | 0.41%  | 2.05%  | 82.06% | 10.36%       | 4.95%  |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.07%  | 0.30%  | 90.90%       | 8.73%  |
| <b>US ABS</b>                |        |        |        |        |        |        |              |        |
| Aaa                          | 86.46% | 0.64%  | 0.29%  | 0.13%  | 0.06%  | 0.04%  | 0.09%        | 12.30% |
| Aa                           | 2.58%  | 87.63% | 1.96%  | 0.95%  | 0.36%  | 0.21%  | 0.43%        | 5.89%  |
| A                            | 0.76%  | 1.29%  | 86.57% | 1.82%  | 0.75%  | 0.33%  | 0.29%        | 8.19%  |
| Baa                          | 0.30%  | 0.35%  | 0.92%  | 87.31% | 3.28%  | 1.32%  | 1.42%        | 5.11%  |
| Ba                           | 0.16%  | 0.22%  | 0.16%  | 3.71%  | 73.94% | 5.51%  | 11.83%       | 4.47%  |
| B                            | 0.00%  | 0.00%  | 0.16%  | 0.47%  | 0.47%  | 70.54% | 25.89%       | 2.48%  |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.19%  | 90.98%       | 8.83%  |
| <b>US HEL</b>                |        |        |        |        |        |        |              |        |
| Aaa                          | 91.13% | 0.11%  | 0.00%  | 0.00%  | 0.03%  | 0.00%  | 0.00%        | 8.74%  |
| Aa                           | 2.49%  | 91.77% | 0.55%  | 0.03%  | 0.03%  | 0.03%  | 0.00%        | 5.10%  |
| A                            | 0.44%  | 1.83%  | 92.58% | 1.20%  | 0.34%  | 0.02%  | 0.05%        | 3.54%  |
| Baa                          | 0.04%  | 0.17%  | 0.73%  | 92.01% | 1.83%  | 0.67%  | 0.58%        | 3.97%  |
| Ba                           | 0.00%  | 0.25%  | 0.25%  | 2.83%  | 85.87% | 2.58%  | 4.55%        | 3.69%  |
| B                            | 0.00%  | 0.00%  | 0.37%  | 0.74%  | 1.11%  | 82.66% | 11.44%       | 3.69%  |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 81.12%       | 18.88% |
| <b>US ABS excl. MH, HEL</b>  |        |        |        |        |        |        |              |        |
| Aaa                          | 84.79% | 0.51%  | 0.12%  | 0.11%  | 0.01%  | 0.01%  | 0.12%        | 14.33% |
| Aa                           | 2.58%  | 80.21% | 3.52%  | 1.95%  | 0.63%  | 0.13%  | 0.75%        | 10.24% |
| A                            | 0.87%  | 1.03%  | 83.86% | 2.05%  | 0.63%  | 0.17%  | 0.15%        | 11.23% |
| Baa                          | 0.92%  | 0.65%  | 1.43%  | 80.26% | 3.61%  | 1.71%  | 1.43%        | 9.99%  |
| Ba                           | 0.48%  | 0.00%  | 0.16%  | 1.44%  | 70.79% | 8.19%  | 10.59%       | 8.35%  |
| B                            | 0.00%  | 0.00%  | 0.00%  | 0.48%  | 0.00%  | 63.16% | 33.97%       | 2.39%  |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.48%  | 84.89%       | 14.63% |
| <b>US CDOs</b>               |        |        |        |        |        |        |              |        |
| Aaa                          | 90.46% | 2.25%  | 0.72%  | 0.36%  | 0.08%  | 0.00%  | 0.00%        | 6.12%  |
| Aa                           | 0.93%  | 85.94% | 4.28%  | 2.16%  | 0.67%  | 0.26%  | 0.15%        | 5.62%  |
| A                            | 0.33%  | 1.08%  | 86.99% | 3.04%  | 1.25%  | 0.43%  | 0.65%        | 6.23%  |
| Baa                          | 0.00%  | 0.11%  | 0.51%  | 84.38% | 4.39%  | 2.93%  | 2.30%        | 5.38%  |
| Ba                           | 0.00%  | 0.07%  | 0.00%  | 0.34%  | 82.17% | 4.61%  | 7.80%        | 5.02%  |
| B                            | 0.00%  | 0.00%  | 0.19%  | 0.00%  | 1.30%  | 72.91% | 21.71%       | 3.90%  |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.14%  | 0.00%  | 95.16%       | 4.70%  |
| <b>US CDOs excl. HY CBOs</b> |        |        |        |        |        |        |              |        |
| Aaa                          | 91.28% | 1.47%  | 0.46%  | 0.15%  | 0.05%  | 0.00%  | 0.00%        | 6.59%  |
| Aa                           | 0.72%  | 87.82% | 3.19%  | 1.17%  | 0.39%  | 0.13%  | 0.13%        | 6.45%  |
| A                            | 0.25%  | 0.76%  | 88.78% | 2.09%  | 0.76%  | 0.32%  | 0.44%        | 6.59%  |
| Baa                          | 0.00%  | 0.10%  | 0.39%  | 87.14% | 2.60%  | 2.16%  | 1.52%        | 6.09%  |
| Ba                           | 0.00%  | 0.00%  | 0.00%  | 0.49%  | 86.52% | 2.93%  | 3.91%        | 6.15%  |
| B                            | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.76%  | 74.24% | 18.94%       | 6.06%  |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 88.83%       | 11.17% |
| <b>US CMBS</b>               |        |        |        |        |        |        |              |        |
| Aaa                          | 87.99% | 0.75%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        | 11.26% |
| Aa                           | 11.47% | 79.91% | 0.60%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        | 8.02%  |
| A                            | 2.53%  | 6.70%  | 84.03% | 1.12%  | 0.04%  | 0.00%  | 0.00%        | 5.58%  |
| Baa                          | 0.71%  | 0.99%  | 4.68%  | 83.08% | 2.14%  | 0.26%  | 0.00%        | 8.13%  |
| Ba                           | 0.05%  | 0.05%  | 0.28%  | 2.32%  | 89.93% | 2.88%  | 0.28%        | 4.21%  |
| B                            | 0.16%  | 0.00%  | 0.05%  | 0.32%  | 0.75%  | 89.70% | 6.42%        | 2.59%  |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.72%  | 91.73%       | 7.55%  |
| <b>US RMBS</b>               |        |        |        |        |        |        |              |        |
| Aaa                          | 87.81% | 0.12%  | 0.06%  | 0.02%  | 0.00%  | 0.00%  | 0.00%        | 11.99% |
| Aa                           | 8.22%  | 81.48% | 0.60%  | 0.24%  | 0.00%  | 0.01%  | 0.01%        | 9.44%  |
| A                            | 2.07%  | 5.94%  | 82.12% | 0.82%  | 0.17%  | 0.04%  | 0.19%        | 8.64%  |
| Baa                          | 0.55%  | 0.82%  | 5.60%  | 83.15% | 0.82%  | 0.61%  | 0.78%        | 7.68%  |
| Ba                           | 0.13%  | 0.13%  | 1.32%  | 5.87%  | 83.05% | 0.84%  | 2.12%        | 6.53%  |
| B                            | 0.00%  | 0.00%  | 0.07%  | 0.59%  | 4.35%  | 83.47% | 3.99%        | 7.53%  |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.14%  | 0.00%  | 87.91%       | 11.96% |

**Figure 40 – Two-Year Rating Transition Matrices by Sector (1996-2005)**

| Global Structured Finance    | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
|------------------------------|--------|--------|--------|--------|--------|--------|--------------|--------|
| Aaa                          | 73.92% | 0.94%  | 0.42%  | 0.21%  | 0.11%  | 0.08%  | 0.11%        | 24.21% |
| Aa                           | 9.16%  | 67.80% | 2.51%  | 1.39%  | 0.52%  | 0.33%  | 0.56%        | 17.72% |
| A                            | 2.61%  | 4.66%  | 70.06% | 2.63%  | 1.07%  | 0.53%  | 0.92%        | 17.52% |
| Baa                          | 0.85%  | 1.29%  | 4.56%  | 69.19% | 3.90%  | 2.02%  | 3.26%        | 14.94% |
| Ba                           | 0.15%  | 0.28%  | 1.48%  | 4.43%  | 66.57% | 4.53%  | 10.37%       | 12.18% |
| B                            | 0.03%  | 0.00%  | 0.17%  | 0.86%  | 3.31%  | 67.60% | 16.99%       | 11.04% |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.20%  | 0.61%  | 81.42%       | 17.76% |
| <b>US ABS</b>                |        |        |        |        |        |        |              |        |
| Aaa                          | 71.60% | 1.01%  | 0.63%  | 0.35%  | 0.24%  | 0.19%  | 0.24%        | 25.74% |
| Aa                           | 3.97%  | 73.50% | 3.16%  | 2.26%  | 1.03%  | 0.75%  | 1.65%        | 13.68% |
| A                            | 1.39%  | 2.04%  | 71.72% | 2.78%  | 1.24%  | 0.83%  | 1.36%        | 18.63% |
| Baa                          | 0.68%  | 0.75%  | 1.48%  | 72.38% | 5.02%  | 2.71%  | 4.74%        | 12.23% |
| Ba                           | 0.21%  | 0.50%  | 0.35%  | 1.13%  | 55.21% | 5.53%  | 26.51%       | 10.56% |
| B                            | 0.20%  | 0.00%  | 0.40%  | 1.00%  | 0.80%  | 52.51% | 37.27%       | 7.82%  |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.52%  | 77.00%       | 22.47% |
| <b>US HEL</b>                |        |        |        |        |        |        |              |        |
| Aaa                          | 79.54% | 0.27%  | 0.00%  | 0.00%  | 0.04%  | 0.00%  | 0.00%        | 20.15% |
| Aa                           | 5.26%  | 80.24% | 1.21%  | 0.17%  | 0.09%  | 0.04%  | 0.00%        | 12.99% |
| A                            | 0.99%  | 3.85%  | 81.10% | 2.90%  | 1.03%  | 0.24%  | 0.20%        | 9.69%  |
| Baa                          | 0.14%  | 0.36%  | 1.72%  | 79.70% | 3.72%  | 1.68%  | 2.08%        | 10.60% |
| Ba                           | 0.18%  | 0.53%  | 0.53%  | 1.58%  | 70.95% | 4.05%  | 11.62%       | 10.56% |
| B                            | 0.44%  | 0.00%  | 0.88%  | 1.33%  | 1.77%  | 70.80% | 13.72%       | 11.06% |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 62.07%       | 37.93% |
| <b>US ABS excl. MH, HEL</b>  |        |        |        |        |        |        |              |        |
| Aaa                          | 69.63% | 0.63%  | 0.34%  | 0.23%  | 0.09%  | 0.05%  | 0.27%        | 28.76% |
| Aa                           | 2.36%  | 62.33% | 4.41%  | 4.87%  | 1.83%  | 0.30%  | 1.90%        | 21.99% |
| A                            | 1.51%  | 1.38%  | 69.03% | 2.58%  | 0.98%  | 0.65%  | 0.83%        | 23.05% |
| Baa                          | 1.78%  | 1.27%  | 1.44%  | 62.37% | 4.03%  | 2.99%  | 4.55%        | 21.58% |
| Ba                           | 0.42%  | 0.00%  | 0.42%  | 1.26%  | 51.05% | 6.30%  | 21.85%       | 18.70% |
| B                            | 0.00%  | 0.00%  | 0.00%  | 1.31%  | 0.00%  | 42.48% | 47.71%       | 8.50%  |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 1.17%  | 64.45%       | 34.38% |
| <b>US CDOs</b>               |        |        |        |        |        |        |              |        |
| Aaa                          | 79.10% | 4.67%  | 2.28%  | 1.00%  | 0.33%  | 0.17%  | 0.06%        | 12.40% |
| Aa                           | 1.51%  | 70.57% | 7.39%  | 4.93%  | 1.98%  | 1.10%  | 0.68%        | 11.84% |
| A                            | 0.63%  | 1.88%  | 72.77% | 4.62%  | 2.97%  | 1.41%  | 2.35%        | 13.38% |
| Baa                          | 0.00%  | 0.29%  | 0.86%  | 67.00% | 7.30%  | 5.34%  | 8.25%        | 10.97% |
| Ba                           | 0.00%  | 0.09%  | 0.00%  | 0.88%  | 64.10% | 7.16%  | 18.21%       | 9.55%  |
| B                            | 0.00%  | 0.00%  | 0.23%  | 0.00%  | 2.10%  | 55.14% | 34.35%       | 8.18%  |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.22%  | 0.00%  | 90.09%       | 9.70%  |
| <b>US CDOs excl. HY CBOs</b> |        |        |        |        |        |        |              |        |
| Aaa                          | 81.37% | 2.66%  | 1.40%  | 0.52%  | 0.22%  | 0.07%  | 0.07%        | 13.67% |
| Aa                           | 1.19%  | 74.95% | 5.67%  | 2.10%  | 0.82%  | 0.73%  | 0.37%        | 14.17% |
| A                            | 0.47%  | 1.70%  | 76.09% | 3.12%  | 1.80%  | 0.95%  | 1.51%        | 14.37% |
| Baa                          | 0.00%  | 0.20%  | 0.74%  | 72.71% | 4.67%  | 3.52%  | 5.21%        | 12.93% |
| Ba                           | 0.00%  | 0.00%  | 0.00%  | 1.34%  | 72.82% | 4.15%  | 9.37%        | 12.32% |
| B                            | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 1.00%  | 64.00% | 22.50%       | 12.50% |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 73.55%       | 26.45% |
| <b>US CMBS</b>               |        |        |        |        |        |        |              |        |
| Aaa                          | 78.15% | 1.10%  | 0.06%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        | 20.69% |
| Aa                           | 18.50% | 62.40% | 1.06%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        | 18.05% |
| A                            | 4.37%  | 10.68% | 69.76% | 1.75%  | 0.44%  | 0.00%  | 0.00%        | 13.01% |
| Baa                          | 1.36%  | 1.86%  | 7.79%  | 66.51% | 3.12%  | 0.63%  | 0.10%        | 18.63% |
| Ba                           | 0.06%  | 0.32%  | 0.58%  | 4.02%  | 80.16% | 5.45%  | 0.91%        | 8.50%  |
| B                            | 0.00%  | 0.00%  | 0.07%  | 0.73%  | 1.23%  | 78.68% | 13.63%       | 5.66%  |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 1.70%  | 82.95%       | 15.34% |
| <b>US RMBS</b>               |        |        |        |        |        |        |              |        |
| Aaa                          | 73.63% | 0.24%  | 0.10%  | 0.04%  | 0.00%  | 0.00%  | 0.06%        | 25.94% |
| Aa                           | 13.62% | 64.21% | 0.93%  | 0.44%  | 0.00%  | 0.02%  | 0.05%        | 20.74% |
| A                            | 5.61%  | 7.84%  | 64.31% | 1.35%  | 0.24%  | 0.11%  | 0.45%        | 20.10% |
| Baa                          | 1.33%  | 2.46%  | 7.92%  | 66.73% | 1.18%  | 0.86%  | 1.63%        | 17.88% |
| Ba                           | 0.31%  | 0.31%  | 4.12%  | 9.34%  | 65.71% | 0.99%  | 3.55%        | 15.66% |
| B                            | 0.00%  | 0.00%  | 0.09%  | 1.23%  | 6.58%  | 67.37% | 5.88%        | 18.86% |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.31%  | 0.00%  | 80.18%       | 19.51% |

**Figure 41 – Three-Year Rating Transition Matrices by Sector (1996-2005)**

| Global Structured Finance    | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
|------------------------------|--------|--------|--------|--------|--------|--------|--------------|--------|
| Aaa                          | 60.93% | 1.12%  | 0.58%  | 0.36%  | 0.18%  | 0.14%  | 0.22%        | 36.47% |
| Aa                           | 11.36% | 53.68% | 2.85%  | 2.06%  | 0.86%  | 0.68%  | 1.06%        | 27.47% |
| A                            | 3.41%  | 5.13%  | 56.55% | 2.96%  | 1.37%  | 0.71%  | 1.77%        | 28.10% |
| Baa                          | 1.14%  | 1.66%  | 5.16%  | 55.43% | 4.24%  | 2.85%  | 6.30%        | 23.22% |
| Ba                           | 0.28%  | 0.49%  | 2.17%  | 5.07%  | 53.57% | 4.85%  | 14.67%       | 18.90% |
| B                            | 0.07%  | 0.00%  | 0.22%  | 1.19%  | 3.06%  | 55.78% | 21.57%       | 18.10% |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.25%  | 0.66%  | 72.03%       | 27.07% |
| <b>US ABS</b>                |        |        |        |        |        |        |              |        |
| Aaa                          | 57.23% | 1.09%  | 0.78%  | 0.60%  | 0.38%  | 0.32%  | 0.44%        | 39.16% |
| Aa                           | 5.13%  | 60.30% | 3.97%  | 3.07%  | 1.38%  | 1.66%  | 3.07%        | 21.41% |
| A                            | 1.55%  | 2.22%  | 57.84% | 3.20%  | 1.49%  | 0.98%  | 2.54%        | 30.18% |
| Baa                          | 0.64%  | 0.90%  | 1.98%  | 57.22% | 5.62%  | 4.01%  | 9.28%        | 20.35% |
| Ba                           | 0.27%  | 0.81%  | 0.54%  | 1.08%  | 44.12% | 4.61%  | 33.09%       | 15.46% |
| B                            | 0.57%  | 0.00%  | 0.85%  | 1.42%  | 1.42%  | 41.60% | 39.03%       | 15.10% |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.75%  | 56.72%       | 42.54% |
| <b>US HEL</b>                |        |        |        |        |        |        |              |        |
| Aaa                          | 67.60% | 0.28%  | 0.06%  | 0.00%  | 0.06%  | 0.00%  | 0.00%        | 32.01% |
| Aa                           | 7.97%  | 67.48% | 2.12%  | 0.39%  | 0.19%  | 0.06%  | 0.00%        | 21.79% |
| A                            | 2.03%  | 5.73%  | 67.04% | 4.81%  | 1.73%  | 0.55%  | 0.62%        | 17.50% |
| Baa                          | 0.36%  | 0.72%  | 3.28%  | 64.24% | 6.21%  | 3.40%  | 4.48%        | 17.31% |
| Ba                           | 0.45%  | 0.90%  | 0.90%  | 2.24%  | 58.30% | 4.71%  | 17.04%       | 15.47% |
| B                            | 1.06%  | 0.00%  | 1.59%  | 2.12%  | 2.65%  | 56.61% | 16.40%       | 19.58% |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 37.78%       | 62.22% |
| <b>US ABS excl. MH, HEL</b>  |        |        |        |        |        |        |              |        |
| Aaa                          | 54.95% | 0.57%  | 0.44%  | 0.38%  | 0.16%  | 0.11%  | 0.39%        | 43.01% |
| Aa                           | 2.27%  | 46.82% | 4.73%  | 6.18%  | 2.64%  | 1.36%  | 3.18%        | 32.82% |
| A                            | 1.34%  | 1.19%  | 55.91% | 2.65%  | 1.23%  | 0.74%  | 1.60%        | 35.35% |
| Baa                          | 1.28%  | 0.83%  | 0.98%  | 46.92% | 2.26%  | 3.16%  | 7.52%        | 37.07% |
| Ba                           | 0.29%  | 0.00%  | 0.58%  | 0.29%  | 38.19% | 5.25%  | 26.24%       | 29.15% |
| B                            | 0.00%  | 0.00%  | 0.00%  | 1.03%  | 0.00%  | 31.96% | 50.52%       | 16.49% |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 1.46%  | 40.88%       | 57.66% |
| <b>US CDOs</b>               |        |        |        |        |        |        |              |        |
| Aaa                          | 65.07% | 7.69%  | 4.24%  | 1.88%  | 0.63%  | 0.55%  | 0.08%        | 19.86% |
| Aa                           | 1.39%  | 53.71% | 10.02% | 8.63%  | 4.27%  | 1.95%  | 1.76%        | 18.27% |
| A                            | 0.46%  | 2.20%  | 55.50% | 5.79%  | 4.75%  | 2.67%  | 5.45%        | 23.17% |
| Baa                          | 0.06%  | 0.31%  | 0.69%  | 48.09% | 8.85%  | 7.97%  | 16.51%       | 17.51% |
| Ba                           | 0.00%  | 0.00%  | 0.00%  | 1.20%  | 45.79% | 8.17%  | 30.53%       | 14.30% |
| B                            | 0.00%  | 0.00%  | 0.31%  | 0.00%  | 1.56%  | 38.44% | 46.56%       | 13.13% |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 84.35%       | 15.65% |
| <b>US CDOs excl. HY CBOs</b> |        |        |        |        |        |        |              |        |
| Aaa                          | 68.67% | 4.57%  | 2.45%  | 0.89%  | 0.33%  | 0.22%  | 0.11%        | 22.74% |
| Aa                           | 1.46%  | 60.90% | 8.11%  | 3.46%  | 1.60%  | 1.20%  | 0.53%        | 22.74% |
| A                            | 0.43%  | 2.16%  | 59.63% | 4.17%  | 2.87%  | 1.44%  | 3.30%        | 26.01% |
| Baa                          | 0.00%  | 0.19%  | 0.66%  | 55.81% | 6.42%  | 5.67%  | 9.44%        | 21.81% |
| Ba                           | 0.00%  | 0.00%  | 0.00%  | 1.95%  | 57.78% | 4.67%  | 15.56%       | 20.04% |
| B                            | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.69%  | 54.48% | 24.14%       | 20.69% |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 52.63%       | 47.37% |
| <b>US CMBS</b>               |        |        |        |        |        |        |              |        |
| Aaa                          | 70.06% | 0.88%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        | 29.06% |
| Aa                           | 22.91% | 49.31% | 1.24%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        | 26.55% |
| A                            | 6.00%  | 12.92% | 58.64% | 2.02%  | 0.85%  | 0.00%  | 0.00%        | 19.57% |
| Baa                          | 1.70%  | 2.55%  | 9.74%  | 56.59% | 3.31%  | 0.71%  | 0.18%        | 25.23% |
| Ba                           | 0.09%  | 0.84%  | 0.47%  | 5.13%  | 70.24% | 7.74%  | 1.87%        | 13.62% |
| B                            | 0.00%  | 0.00%  | 0.20%  | 0.81%  | 1.32%  | 67.31% | 20.10%       | 10.25% |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 2.65%  | 80.53%       | 16.81% |
| <b>US RMBS</b>               |        |        |        |        |        |        |              |        |
| Aaa                          | 61.62% | 0.36%  | 0.14%  | 0.07%  | 0.00%  | 0.00%  | 0.13%        | 37.69% |
| Aa                           | 16.11% | 50.32% | 1.04%  | 0.68%  | 0.07%  | 0.06%  | 0.09%        | 31.63% |
| A                            | 7.81%  | 7.43%  | 52.17% | 1.40%  | 0.22%  | 0.19%  | 0.67%        | 30.10% |
| Baa                          | 2.14%  | 2.97%  | 7.43%  | 55.61% | 0.92%  | 0.89%  | 3.09%        | 26.94% |
| Ba                           | 0.55%  | 0.37%  | 5.78%  | 9.72%  | 54.18% | 0.98%  | 4.49%        | 23.92% |
| B                            | 0.00%  | 0.00%  | 0.00%  | 1.69%  | 5.19%  | 56.40% | 8.25%        | 28.47% |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.36%  | 0.00%  | 73.39%       | 26.25% |

**Figure 42 – One-Year Rating Transition Matrices by Sector in 2005 (adjusted for withdrawn ratings)**

| Global Structured Finance    | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below |
|------------------------------|--------|--------|--------|--------|--------|--------|--------------|
| Aaa                          | 99.70% | 0.24%  | 0.04%  | 0.00%  | 0.01%  | 0.00%  | 0.00%        |
| Aa                           | 8.25%  | 90.61% | 0.83%  | 0.18%  | 0.07%  | 0.04%  | 0.02%        |
| A                            | 2.03%  | 5.57%  | 91.30% | 0.76%  | 0.18%  | 0.04%  | 0.13%        |
| Baa                          | 0.45%  | 0.57%  | 4.23%  | 93.07% | 1.02%  | 0.39%  | 0.27%        |
| Ba                           | 0.10%  | 0.10%  | 0.21%  | 3.44%  | 92.66% | 2.52%  | 0.98%        |
| B                            | 0.10%  | 0.00%  | 0.20%  | 0.00%  | 2.66%  | 89.76% | 7.29%        |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.10%  | 0.10%  | 99.79%       |
| <b>US ABS</b>                |        |        |        |        |        |        |              |
| Aaa                          | 99.68% | 0.27%  | 0.00%  | 0.00%  | 0.05%  | 0.00%  | 0.00%        |
| Aa                           | 4.26%  | 94.94% | 0.74%  | 0.00%  | 0.00%  | 0.06%  | 0.00%        |
| A                            | 1.17%  | 2.64%  | 95.01% | 0.84%  | 0.21%  | 0.00%  | 0.13%        |
| Baa                          | 0.04%  | 0.28%  | 1.32%  | 96.36% | 1.32%  | 0.40%  | 0.28%        |
| Ba                           | 0.24%  | 0.24%  | 0.00%  | 2.88%  | 90.64% | 5.04%  | 0.96%        |
| B                            | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 87.37% | 12.63%       |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.21%  | 99.79%       |
| <b>US HEL</b>                |        |        |        |        |        |        |              |
| Aaa                          | 99.91% | 0.00%  | 0.00%  | 0.00%  | 0.09%  | 0.00%  | 0.00%        |
| Aa                           | 3.48%  | 95.65% | 0.79%  | 0.00%  | 0.00%  | 0.08%  | 0.00%        |
| A                            | 0.45%  | 2.31%  | 95.95% | 0.90%  | 0.32%  | 0.00%  | 0.06%        |
| Baa                          | 0.00%  | 0.15%  | 0.60%  | 96.88% | 1.56%  | 0.50%  | 0.30%        |
| Ba                           | 0.00%  | 0.41%  | 0.00%  | 1.64%  | 92.62% | 3.69%  | 1.64%        |
| B                            | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 74.42% | 25.58%       |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 100.00%      |
| <b>US ABS excl. MH, HEL</b>  |        |        |        |        |        |        |              |
| Aaa                          | 99.37% | 0.63%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        |
| Aa                           | 7.52%  | 92.11% | 0.38%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        |
| A                            | 2.71%  | 3.49%  | 92.77% | 0.77%  | 0.00%  | 0.00%  | 0.26%        |
| Baa                          | 0.25%  | 0.25%  | 3.21%  | 95.56% | 0.49%  | 0.00%  | 0.25%        |
| Ba                           | 0.70%  | 0.00%  | 0.00%  | 4.91%  | 87.37% | 7.02%  | 0.00%        |
| B                            | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 87.16% | 12.84%       |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.65%  | 99.35%       |
| <b>US CDOs</b>               |        |        |        |        |        |        |              |
| Aaa                          | 99.24% | 0.46%  | 0.31%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        |
| Aa                           | 1.96%  | 94.12% | 1.96%  | 1.09%  | 0.65%  | 0.00%  | 0.22%        |
| A                            | 1.10%  | 1.83%  | 96.16% | 0.37%  | 0.00%  | 0.18%  | 0.37%        |
| Baa                          | 0.00%  | 0.33%  | 1.31%  | 95.90% | 0.82%  | 0.82%  | 0.82%        |
| Ba                           | 0.00%  | 0.30%  | 0.00%  | 0.00%  | 95.45% | 1.82%  | 2.43%        |
| B                            | 0.00%  | 0.00%  | 0.93%  | 0.00%  | 3.74%  | 83.18% | 12.15%       |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.39%  | 0.00%  | 99.61%       |
| <b>US CDOs excl. HY CBOs</b> |        |        |        |        |        |        |              |
| Aaa                          | 99.15% | 0.51%  | 0.34%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        |
| Aa                           | 1.19%  | 94.54% | 2.14%  | 1.19%  | 0.71%  | 0.00%  | 0.24%        |
| A                            | 0.80%  | 0.80%  | 97.41% | 0.40%  | 0.00%  | 0.20%  | 0.40%        |
| Baa                          | 0.00%  | 0.19%  | 0.93%  | 96.28% | 0.74%  | 0.93%  | 0.93%        |
| Ba                           | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 95.08% | 1.89%  | 3.03%        |
| B                            | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 3.28%  | 77.05% | 19.67%       |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 100.00%      |
| <b>US CMBS</b>               |        |        |        |        |        |        |              |
| Aaa                          | 99.78% | 0.22%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        |
| Aa                           | 22.95% | 76.85% | 0.20%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        |
| A                            | 5.72%  | 13.90% | 80.21% | 0.16%  | 0.00%  | 0.00%  | 0.00%        |
| Baa                          | 1.92%  | 1.54%  | 10.62% | 84.64% | 1.28%  | 0.00%  | 0.00%        |
| Ba                           | 0.18%  | 0.00%  | 0.00%  | 3.19%  | 93.79% | 2.66%  | 0.18%        |
| B                            | 0.21%  | 0.00%  | 0.00%  | 0.00%  | 0.43%  | 91.91% | 7.45%        |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 100.00%      |
| <b>US RMBS</b>               |        |        |        |        |        |        |              |
| Aaa                          | 99.95% | 0.00%  | 0.05%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        |
| Aa                           | 11.38% | 88.21% | 0.10%  | 0.21%  | 0.00%  | 0.10%  | 0.00%        |
| A                            | 1.68%  | 8.89%  | 87.74% | 0.96%  | 0.36%  | 0.12%  | 0.24%        |
| Baa                          | 0.00%  | 0.52%  | 7.67%  | 89.99% | 0.52%  | 0.91%  | 0.39%        |
| Ba                           | 0.00%  | 0.00%  | 0.58%  | 5.52%  | 91.29% | 1.16%  | 1.45%        |
| B                            | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 7.08%  | 91.04% | 1.89%        |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 100.00%      |

**Figure 43 – Global Structured Finance One-Year Refined-Rating Transition Matrix in 2005**

|      | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1  | Caa2  | Caa3  | Ca    | C     | WR    |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Aaa  | 7479  | 89.4% | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  |       |       |       |       |       | 0.0%  |       |       |       |       |       |       |       |       | 10.3% |
| Aa1  | 708   | 10.7% | 81.8% | 0.6%  | 0.3%  | 0.1%  | 0.1%  | 0.1%  |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 6.2%  |
| Aa2  | 3088  | 7.3%  | 2.1%  | 82.6% | 0.3%  | 0.3%  | 0.4%  | 0.1%  |       | 0.1%  | 0.0%  |       |       |       | 0.0%  | 0.0%  |       |       |       | 0.0%  |       |       | 6.7%  |
| Aa3  | 919   | 8.1%  | 2.5%  | 2.7%  | 77.3% | 0.8%  | 0.4%  | 0.1%  | 0.1%  | 0.2%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  |       |       |       |       |       |       |       |       | 7.4%  |
| A1   | 876   | 2.3%  | 1.8%  | 3.2%  | 2.6%  | 78.2% | 0.3%  | 0.5%  | 0.1%  | 0.1%  |       |       |       |       |       |       |       | 0.1%  |       |       |       |       | 10.7% |
| A2   | 3393  | 2.2%  | 0.6%  | 2.9%  | 1.7%  | 1.9%  | 83.0% | 0.2%  | 0.4%  | 0.4%  | 0.1%  | 0.1%  | 0.0%  | 0.1%  | 0.0%  |       |       | 0.0%  | 0.0%  |       |       | 0.0%  | 6.4%  |
| A3   | 1354  | 1.1%  | 0.8%  | 1.0%  | 2.5%  | 2.5%  | 3.0%  | 81.1% | 0.4%  | 0.4%  | 0.1%  | 0.1%  |       | 0.1%  |       | 0.1%  |       | 0.2%  |       |       |       |       | 6.6%  |
| Baa1 | 1086  | 0.6%  | 0.1%  | 0.2%  | 0.6%  | 1.4%  | 1.5%  | 2.0%  | 87.8% | 0.3%  | 0.6%  | 0.2%  | 0.2%  |       |       | 0.1%  | 0.1%  |       |       |       |       |       | 4.3%  |
| Baa2 | 3121  | 0.4%  |       | 0.3%  | 0.3%  | 0.7%  | 2.2%  | 1.6%  | 2.9%  | 83.5% | 0.4%  | 0.5%  | 0.3%  | 0.4%  | 0.2%  | 0.1%  |       | 0.1%  | 0.1%  | 0.1%  | 0.1%  |       | 5.8%  |
| Baa3 | 1546  | 0.3%  | 0.1%  |       | 0.1%  | 0.6%  | 0.6%  | 1.6%  | 1.6%  | 2.1%  | 84.0% | 0.1%  | 0.6%  | 0.3%  | 0.3%  | 0.1%  | 0.4%  |       |       |       | 0.1%  | 0.1%  | 6.9%  |
| Ba1  | 528   | 0.2%  | 0.2%  |       |       |       | 0.2%  | 0.2%  | 0.8%  | 2.1%  | 3.6%  | 85.0% | 0.2%  | 0.8%  | 0.6%  | 0.6%  | 0.4%  |       | 0.2%  |       | 0.2%  |       | 4.9%  |
| Ba2  | 990   | 0.1%  |       | 0.1%  |       |       |       | 0.2%  | 0.3%  | 1.1%  | 0.8%  | 1.9%  | 87.4% | 0.7%  | 0.2%  | 1.1%  | 0.7%  |       | 0.1%  | 0.1%  | 0.2%  | 0.2%  | 4.7%  |
| Ba3  | 483   |       |       |       |       |       |       |       | 0.2%  | 0.6%  | 1.4%  | 1.9%  | 1.9%  | 80.5% | 2.1%  | 1.2%  | 1.0%  | 1.0%  |       |       | 0.4%  | 0.8%  | 6.8%  |
| B1   | 252   |       |       |       |       | 0.4%  |       | 0.4%  |       |       |       | 0.4%  | 1.2%  | 2.4%  | 83.3% | 1.2%  | 1.2%  | 1.6%  | 0.4%  | 0.4%  | 1.2%  | 0.8%  | 5.2%  |
| B2   | 490   | 0.2%  |       |       |       |       |       |       |       |       |       | 0.4%  | 1.0%  | 1.4%  | 0.8%  | 83.7% | 2.9%  | 0.8%  | 1.8%  | 0.4%  | 1.2%  | 0.2%  | 5.1%  |
| B3   | 305   |       |       |       |       |       |       |       |       |       |       |       | 1.0%  |       | 1.0%  | 1.0%  | 75.4% | 4.9%  | 4.3%  | 1.6%  | 1.6%  | 1.0%  | 8.2%  |
| Caa1 | 130   |       |       |       |       |       |       |       |       |       |       |       | 0.8%  |       |       |       |       | 74.6% | 3.8%  | 6.9%  | 3.1%  | 1.5%  | 9.2%  |
| Caa2 | 129   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 0.8%  | 2.3%  | 71.3% | 4.7%  | 7.8%  | 3.1%  | 10.1% |
| Caa3 | 100   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 1.0%  |       | 82.0% | 4.0%  | 6.0%  | 7.0%  |
| Ca   | 239   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 83.3% | 5.4%  | 11.3% |
| C    | 394   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 95.2% | 4.8%  |

Figure 44 – US ABS One-Year Refined-Rating Transition Matrix in 2005

|      | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2  | Ba3   | B1    | B2    | B3    | Caa1 | Caa2 | Caa3 | Ca   | C    | WR    |      |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|------|------|------|------|------|-------|------|
| Aaa  | 2329  | 88.0% | 0.0%  | 0.2%  | 0.0%  |       |       |       |       |       |       |       |      | 0.0%  |       |       |       |      |      |      |      |      | 11.7% |      |
| Aa1  | 186   | 2.2%  | 91.4% | 0.5%  |       |       |       |       |       |       |       |       |      |       |       |       |       |      |      |      |      |      | 5.9%  |      |
| Aa2  | 1205  | 4.2%  | 0.7%  | 89.0% |       | 0.2%  | 0.3%  | 0.2%  |       |       |       |       |      |       |       | 0.1%  |       |      |      |      |      |      | 5.1%  |      |
| Aa3  | 273   | 5.1%  | 1.5%  | 1.5%  | 86.1% | 0.4%  | 0.4%  |       |       |       |       |       |      |       |       |       |       |      |      |      |      |      | 5.1%  |      |
| A1   | 350   | 0.6%  | 0.6%  | 0.9%  | 1.7%  | 82.0% | 0.6%  | 0.3%  |       |       |       |       |      |       |       |       |       |      |      |      |      |      | 13.1% |      |
| A2   | 1600  | 1.6%  | 0.4%  | 1.4%  | 1.0%  | 0.6%  | 86.8% | 0.1%  | 0.6%  | 0.4%  | 0.1%  | 0.1%  |      | 0.2%  |       |       |       |      |      |      |      |      | 6.4%  |      |
| A3   | 522   |       |       | 0.4%  | 0.8%  | 0.6%  | 0.2%  | 92.0% | 0.2%  | 0.2%  |       |       |      |       |       |       |       |      |      |      |      |      | 5.6%  |      |
| Baa1 | 550   |       |       |       |       |       |       | 0.4%  | 97.8% |       | 0.4%  | 0.2%  | 0.4% |       |       |       |       |      |      |      |      |      | 0.9%  |      |
| Baa2 | 1281  |       |       | 0.2%  | 0.2%  | 0.5%  | 1.0%  | 0.7%  | 3.3%  | 86.3% | 0.4%  | 0.2%  | 0.5% | 0.9%  | 0.2%  | 0.1%  |       |      |      |      | 0.1% | 0.2% | 0.1%  | 5.0% |
| Baa3 | 720   | 0.1%  | 0.1%  |       | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.4%  |       | 92.6% |       | 0.4% | 0.7%  | 0.4%  | 0.1%  | 0.3%  |      |      |      |      |      | 0.1%  | 3.9% |
| Ba1  | 158   |       |       |       |       |       |       |       |       |       |       | 93.0% |      |       | 1.3%  | 1.9%  | 1.3%  |      |      |      |      |      |       | 2.5% |
| Ba2  | 200   | 0.5%  |       | 0.5%  |       |       |       |       | 1.0%  | 0.5%  | 2.0%  |       |      | 87.5% |       |       |       |      |      |      |      |      | 0.5%  | 2.0% |
| Ba3  | 65    |       |       |       |       |       |       |       | 1.5%  | 1.5%  | 4.6%  | 3.1%  |      |       | 72.3% | 3.1%  | 3.1%  |      |      |      |      |      |       | 7.7% |
| B1   | 32    |       |       |       |       |       |       |       |       |       |       |       |      |       | 78.1% |       |       |      |      |      |      |      | 9.4%  | 6.3% |
| B2   | 60    |       |       |       |       |       |       |       |       |       |       |       |      |       |       | 83.3% |       |      |      |      |      |      | 1.7%  | 1.7% |
| B3   | 54    |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       | 85.2% |      |      |      |      |      | 7.4%  | 7.4% |
| Caa1 | 40    |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |       |      |      |      |      |      | 77.5% | 7.5% |
| Caa2 | 35    |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |       |      |      |      |      |      | 2.5%  | 2.9% |
| Caa3 | 45    |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |       |      |      |      |      |      | 80.0% | 6.7% |
| Ca   | 100   |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |       |      |      |      |      |      | 82.2% | 9.0% |
| C    | 270   |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |       |      |      |      |      |      | 4.4%  | 3.0% |
|      |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |       |      |      |      |      |      | 6.7%  | 6.7% |
|      |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |       |      |      |      |      |      | 86.0% | 9.0% |
|      |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |       |      |      |      |      |      | 97.0% | 3.0% |

**Figure 45 – US HEL One-Year Refined-Rating Transition Matrix in 2005**

|      | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1  | Caa2  | Caa3   | Ca    | C     | WR    |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|-------|-------|-------|
| Aaa  | 1213  | 90.5% |       |       |       |       |       |       |       |       |       |       |       | 0.1%  |       |       |       |       |       |        |       |       | 9.4%  |
| Aa1  | 118   |       | 94.9% |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |        |       |       | 5.1%  |
| Aa2  | 1033  | 4.1%  | 0.7%  | 89.5% |       | 0.3%  | 0.4%  | 0.3%  |       |       |       |       |       |       |       | 0.1%  |       |       |       |        |       |       | 4.6%  |
| Aa3  | 141   | 1.4%  |       |       | 95.7% |       |       |       |       |       |       |       |       |       |       |       |       |       |       |        |       |       | 2.8%  |
| A1   | 137   |       |       |       |       | 95.6% |       |       |       |       |       |       |       |       |       |       |       |       |       |        |       |       | 4.4%  |
| A2   | 1024  | 0.7%  | 0.1%  | 2.1%  | 1.3%  | 0.5%  | 90.0% | 0.1%  | 0.8%  | 0.4%  | 0.2%  | 0.2%  |       | 0.3%  |       |       |       |       |       |        | 0.1%  |       | 3.2%  |
| A3   | 419   |       |       |       |       |       |       | 98.1% |       |       |       |       |       |       |       |       |       |       |       |        |       |       | 1.9%  |
| Baa1 | 475   |       |       |       |       |       |       | 0.2%  | 98.5% |       | 0.2%  | 0.2%  | 0.4%  |       |       |       |       |       |       |        |       |       | 0.4%  |
| Baa2 | 956   |       |       | 0.2%  |       | 0.2%  | 0.2%  | 0.6%  | 0.4%  | 90.8% | 0.3%  | 0.3%  | 0.7%  | 1.3%  | 0.3%  | 0.1%  |       |       |       | 0.2%   | 0.1%  | 0.1%  | 4.1%  |
| Baa3 | 582   |       | 0.2%  |       |       | 0.2%  |       |       |       |       | 94.7% |       | 0.3%  | 0.7%  | 0.5%  | 0.2%  | 0.3%  |       |       |        |       | 0.2%  | 2.6%  |
| Ba1  | 110   |       |       |       |       |       |       |       |       |       |       | 93.6% |       | 0.9%  | 1.8%  | 1.8%  |       |       |       |        |       | 0.2%  | 1.8%  |
| Ba2  | 115   |       |       | 0.9%  |       |       |       |       | 0.9%  | 0.9%  | 0.9%  |       | 91.3% |       | 0.9%  | 0.9%  |       |       |       |        |       | 0.9%  | 1.7%  |
| Ba3  | 21    |       |       |       |       |       |       |       | 4.8%  |       |       |       |       | 76.2% |       |       | 9.5%  | 9.5%  |       |        |       |       |       |
| B1   | 10    |       |       |       |       |       |       |       |       |       |       |       |       |       | 60.0% |       |       | 10.0% |       | 10.0%  | 10.0% |       | 10.0% |
| B2   | 27    |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 70.4% |       |       | 7.4%  | 3.7%   | 14.8% |       | 3.7%  |
| B3   | 8     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 62.5% |       |       | 12.5%  |       |       | 25.0% |
| Caa1 | 3     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 66.7% |        |       |       | 33.3% |
| Caa2 | 9     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 100.0% |       |       |       |
| Caa3 | 11    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |        | 90.9% | 9.1%  |       |
| Ca   | 22    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |        |       | 81.8% | 9.1%  |
| C    | 11    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |        |       |       | 72.7% |

Figure 46 – US ABS (excl. MH, HEL) One-Year Refined-Rating Transition Matrix in 2005

|      | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3 | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1  | Caa2 | Caa3  | Ca    | C     | WR    |       |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|
| Aaa  | 1032  | 84.9% | 0.1%  | 0.4%  | 0.1%  |       |       |       |       |       |      |       |       |       |       |       |       |       |      |       |       |       | 14.5% |       |
| Aa1  | 59    | 6.8%  | 83.1% | 1.7%  |       |       |       |       |       |       |      |       |       |       |       |       |       |       |      |       |       |       |       | 8.5%  |
| Aa2  | 133   | 6.8%  | 1.5%  | 82.7% |       |       |       |       |       |       |      |       |       |       |       |       |       |       |      |       |       |       |       | 9.0%  |
| Aa3  | 86    | 8.1%  |       | 3.5%  | 79.1% |       | 1.2%  |       |       |       |      |       |       |       |       |       |       |       |      |       |       |       |       | 8.1%  |
| A1   | 206   | 1.0%  | 1.0%  | 1.5%  | 2.9%  | 72.3% | 1.0%  | 0.5%  |       |       |      |       |       |       |       |       |       |       | 0.5% |       |       |       |       | 19.4% |
| A2   | 541   | 3.5%  | 1.1%  | 0.2%  | 0.6%  | 0.9%  | 79.9% | 0.2%  | 0.4%  | 0.4%  |      |       |       |       |       |       |       |       |      |       |       |       |       | 12.9% |
| A3   | 91    |       |       | 2.2%  | 4.4%  | 3.3%  | 1.1%  | 67.0% | 1.1%  | 1.1%  |      |       |       |       |       |       |       |       |      |       |       |       |       | 18.7% |
| Baa1 | 63    |       |       |       |       |       |       | 1.6%  | 92.1% |       | 1.6% |       |       |       |       |       |       |       |      |       |       |       |       | 4.8%  |
| Baa2 | 238   |       |       |       |       | 1.3%  | 2.1%  | 0.8%  | 1.3%  | 83.6% | 0.8% |       |       |       |       |       |       |       | 0.4% |       |       |       |       | 9.7%  |
| Baa3 | 124   | 0.8%  |       |       | 0.8%  | 0.8%  | 0.8%  | 2.4%  |       | 82.3% |      |       | 0.8%  | 0.8%  |       |       |       |       |      |       |       |       |       | 10.5% |
| Ba1  | 33    |       |       |       |       |       |       |       |       |       |      | 87.9% |       |       | 3.0%  | 3.0%  |       |       |      |       |       |       |       | 6.1%  |
| Ba2  | 76    | 1.3%  |       |       |       |       |       |       |       |       |      |       | 84.2% |       | 6.6%  | 1.3%  |       |       |      |       |       |       |       | 2.6%  |
| Ba3  | 38    |       |       |       |       |       |       |       | 2.6%  | 7.9%  | 5.3% |       |       | 65.8% | 5.3%  |       |       |       |      |       |       |       |       | 13.2% |
| B1   | 12    |       |       |       |       |       |       |       |       |       |      |       |       |       | 75.0% |       |       |       |      |       |       |       |       | 8.3%  |
| B2   | 23    |       |       |       |       |       |       |       |       |       |      |       |       |       |       | 91.3% |       |       |      |       |       |       |       |       |
| B3   | 21    |       |       |       |       |       |       |       |       |       |      |       |       |       |       |       | 76.2% |       |      |       |       |       |       | 9.5%  |
| Caa1 | 20    |       |       |       |       |       |       |       |       |       |      |       |       |       |       |       |       | 60.0% | 5.0% | 10.0% | 15.0% |       |       | 10.0% |
| Caa2 | 13    |       |       |       |       |       |       |       |       |       |      |       |       |       |       |       |       | 7.7%  |      | 61.5% |       | 23.1% |       | 7.7%  |
| Caa3 | 29    |       |       |       |       |       |       |       |       |       |      |       |       |       |       |       |       |       |      | 75.9% | 3.4%  | 10.3% |       | 10.3% |
| Ca   | 40    |       |       |       |       |       |       |       |       |       |      |       |       |       |       |       |       |       |      |       | 75.0% | 7.5%  |       | 17.5% |
| C    | 59    |       |       |       |       |       |       |       |       |       |      |       |       |       |       |       |       |       |      |       |       |       | 94.9% | 5.1%  |



**Figure 47 – US CDO One-Year Refined-Rating Transition Matrix in 2005**

|      | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1  | Caa2  | Caa3  | Ca    | C     | WR    |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Aaa  | 686   | 89.9% |       | 0.4%  |       | 0.1%  |       | 0.1%  |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 9.3%  |
| Aa1  | 83    | 6.0%  | 85.5% |       |       |       | 1.2%  | 1.2%  |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 6.0%  |
| Aa2  | 301   | 0.7%  | 0.3%  | 88.4% | 0.3%  | 0.3%  | 1.0%  |       |       | 0.7%  |       |       |       |       |       |       |       |       |       | 0.3%  |       |       | 8.0%  |
| Aa3  | 96    | 2.1%  |       |       | 75.0% | 1.0%  | 1.0%  | 1.0%  |       | 2.1%  | 1.0%  | 1.0%  | 1.0%  | 1.0%  |       |       |       |       |       |       |       |       | 13.5% |
| A1   | 92    | 3.3%  | 2.2%  | 2.2%  |       | 83.7% |       | 1.1%  |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 7.6%  |
| A2   | 255   | 1.2%  |       | 0.4%  | 0.4%  |       | 92.5% | 0.4%  |       |       |       |       |       |       |       |       |       |       | 0.4%  |       |       |       | 4.7%  |
| A3   | 220   |       |       | 0.9%  | 0.9%  |       |       | 86.8% | 0.5%  |       | 0.5%  |       |       |       | 0.5%  |       |       | 0.5%  |       |       |       |       | 9.5%  |
| Baa1 | 75    |       |       |       |       | 1.3%  |       |       | 89.3% |       | 1.3%  |       |       |       | 1.3%  | 1.3%  |       |       |       |       |       |       | 5.3%  |
| Baa2 | 420   |       |       | 0.2%  |       |       | 0.2%  | 1.2%  |       | 88.3% | 1.0%  | 0.5%  | 0.5%  |       |       |       |       | 0.2%  |       | 0.2%  | 0.2%  |       | 7.4%  |
| Baa3 | 142   |       | 0.7%  |       |       |       |       | 0.7%  |       | 0.7%  | 80.3% | 0.7%  |       |       |       |       | 2.1%  |       |       |       | 0.7%  | 0.7%  | 13.4% |
| Ba1  | 60    |       | 1.7%  |       |       |       |       |       |       |       |       | 90.0% | 1.7%  |       | 1.7%  |       |       |       |       | 1.7%  |       |       | 1.7%  |
| Ba2  | 181   |       |       |       |       |       |       |       |       |       |       |       | 90.1% | 1.1%  |       |       |       | 0.6%  |       |       |       | 0.6%  | 7.7%  |
| Ba3  | 103   |       |       |       |       |       |       |       |       |       |       |       | 1.0%  | 76.7% | 1.0%  | 1.9%  | 1.0%  |       |       |       | 1.9%  | 2.9%  | 13.6% |
| B1   | 45    |       |       |       |       | 2.2%  |       |       |       |       |       | 2.2%  |       |       | 77.8% |       | 2.2%  | 2.2%  | 2.2%  |       | 4.4%  | 4.4%  | 2.2%  |
| B2   | 38    |       |       |       |       |       |       |       |       |       |       |       | 2.6%  |       |       | 73.7% |       |       |       |       | 5.3%  | 2.6%  | 15.8% |
| B3   | 28    |       |       |       |       |       |       |       |       |       |       |       | 7.1%  |       |       | 3.6%  | 71.4% |       |       | 7.1%  | 7.1%  |       | 3.6%  |
| Caa1 | 17    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 88.2% |       |       |       |       | 5.9%  |
| Caa2 | 34    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 79.4% | 5.9%  | 5.9%  | 2.9%  | 5.9%  |
| Caa3 | 28    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 3.6%  |       | 89.3% | 3.6%  | 3.6%  |       |
| Ca   | 78    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 94.9% |       | 5.1%  |
| C    | 102   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 97.1% | 2.9%  |



**Figure 49 – US CMBS One-Year Refined-Rating Transition Matrix in 2005**

|      | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1  | Caa2  | Caa3  | Ca    | C     | WR    |       |       |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Aaa  | 489   | 88.1% | 0.2%  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 11.7% |       |       |
| Aa1  | 86    | 24.4% | 61.6% |       | 1.2%  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 12.8% |       |
| Aa2  | 293   | 25.6% | 10.2% | 57.3% |       | 0.3%  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 6.5%  |       |
| Aa3  | 145   | 13.8% | 4.8%  | 8.3%  | 68.3% |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 4.8%  |       |
| A1   | 101   | 9.9%  | 5.0%  | 5.9%  | 6.9%  | 60.4% |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 11.9% |       |
| A2   | 273   | 6.2%  | 2.9%  | 6.6%  | 8.1%  | 9.5%  | 63.7% |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 2.9%  |       |
| A3   | 253   | 3.2%  | 2.8%  | 1.2%  | 3.6%  | 5.9%  | 11.1% | 67.6% |       | 0.4%  |       |       |       |       |       |       |       |       |       |       |       |       |       | 4.3%  |       |
| Baa1 | 200   | 3.0%  |       | 1.0%  | 2.0%  | 2.5%  | 5.0%  | 8.0%  | 69.5% |       | 0.5%  | 0.5%  |       |       |       |       |       |       |       |       |       |       |       |       | 8.0%  |
| Baa2 | 308   | 1.9%  |       | 0.6%  | 1.3%  | 2.6%  | 3.9%  | 5.5%  | 8.8%  | 67.9% |       | 1.0%  |       | 0.3%  |       |       |       |       |       |       |       |       |       |       | 6.2%  |
| Baa3 | 301   | 1.0%  |       |       |       | 1.0%  | 1.3%  | 2.7%  | 5.3%  | 8.0%  | 72.4% |       | 1.7%  |       |       |       |       |       |       |       |       |       |       |       | 6.6%  |
| Ba1  | 182   | 0.5%  |       |       |       |       |       |       |       | 2.2%  | 7.7%  | 83.5% |       | 1.6%  |       |       |       |       |       |       |       |       |       |       | 4.4%  |
| Ba2  | 206   |       |       |       |       |       |       |       |       |       |       | 4.9%  | 87.9% | 1.9%  | 0.5%  | 0.5%  | 1.5%  |       |       |       |       |       |       |       | 2.9%  |
| Ba3  | 185   |       |       |       |       |       |       |       |       |       |       | 0.5%  | 2.2%  | 88.6% | 3.8%  | 1.1%  | 0.5%  | 0.5%  |       |       |       |       |       |       | 2.7%  |
| B1   | 143   |       |       |       |       |       |       |       |       |       |       |       |       | 1.4%  | 93.7% | 2.1%  | 1.4%  |       |       |       |       |       |       |       | 1.4%  |
| B2   | 173   | 0.6%  |       |       |       |       |       |       |       |       |       |       |       |       | 1.2%  | 83.8% | 7.5%  | 1.7%  | 2.9%  |       |       |       |       |       | 2.3%  |
| B3   | 160   |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 0.6%  | 78.1% | 9.4%  | 5.0%  | 0.6%  | 1.3%  | 0.6%  |       |       | 4.4%  |
| Caa1 | 33    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 60.6% | 12.1% | 15.2% | 3.0%  | 6.1%  |       |       | 3.0%  |
| Caa2 | 38    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 65.8% | 10.5% | 7.9%  | 7.9%  |       |       | 7.9%  |
| Caa3 | 9     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 66.7% | 11.1% | 22.2% |       |       |       |
| Ca   | 16    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 56.3% | 37.5% |       |       | 6.3%  |
| C    | 6     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 66.7% |
|      |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 33.3% |

Figure 50 – US RMBS One-Year Refined-Rating Transition Matrix in 2005

|      | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1   | B2    | B3   | Caa1  | Caa2  | Caa3  | Ca    | C     | WR    |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|------|-------|-------|-------|-------|-------|-------|
| Aaa  | 2250  | 93.0% |       |       |       |       | 0.0%  |       |       |       |       |       |       |       |      |       |      |       |       |       |       |       | 7.0%  |
| Aa1  | 171   | 9.4%  | 88.9% |       |       |       |       |       |       |       |       |       |       |       |      |       |      |       |       |       |       |       | 1.8%  |
| Aa2  | 701   | 9.8%  | 1.6%  | 83.2% |       | 0.1%  |       |       |       |       | 0.1%  |       |       |       | 0.1% |       |      |       |       |       |       |       | 5.0%  |
| Aa3  | 130   | 20.0% | 3.1%  | 1.5%  | 63.1% |       |       |       | 0.8%  |       |       |       |       |       |      |       |      |       |       |       |       |       | 11.5% |
| A1   | 49    | 4.1%  | 2.0%  | 6.1%  |       | 79.6% |       |       |       | 2.0%  |       |       |       |       |      |       |      |       |       |       |       |       | 6.1%  |
| A2   | 622   | 1.3%  | 0.5%  | 7.1%  | 1.0%  | 1.4%  | 83.4% |       | 0.2%  | 0.6%  | 0.2%  |       | 0.2%  |       | 0.2% |       |      |       |       |       |       | 0.2%  | 3.9%  |
| A3   | 182   | 2.2%  | 0.5%  | 2.2%  | 6.6%  | 5.5%  | 2.7%  | 69.8% |       | 0.5%  |       |       |       | 1.1%  |      |       |      | 0.5%  |       |       |       |       | 8.2%  |
| Baa1 | 62    |       |       |       | 1.6%  | 4.8%  | 1.6%  | 1.6%  | 87.1% |       |       |       |       |       |      |       |      |       |       |       |       |       | 3.2%  |
| Baa2 | 549   |       |       | 0.5%  |       | 0.5%  | 5.3%  | 1.1%  | 1.1%  | 85.2% | 0.4%  | 0.5%  |       |       | 0.5% | 0.2%  |      |       | 0.2%  |       | 0.4%  |       | 4.0%  |
| Baa3 | 179   |       |       |       | 1.1%  | 1.7%  | 6.1%  | 0.6%  | 0.6%  | 77.7% |       |       | 0.6%  |       | 0.6% | 0.6%  | 0.6% |       |       |       |       |       | 10.1% |
| Ba1  | 28    |       |       |       |       | 3.6%  |       | 3.6%  | 10.7% | 3.6%  | 64.3% |       |       |       |      |       |      |       |       |       |       |       | 14.3% |
| Ba2  | 263   |       |       |       |       |       | 0.4%  |       | 3.4%  | 0.8%  | 3.0%  | 89.4% |       |       | 0.4% | 0.4%  |      | 0.4%  |       | 0.4%  | 0.4%  | 0.4%  | 1.1%  |
| Ba3  | 59    |       |       |       |       |       |       |       | 1.7%  | 3.4%  | 10.2% |       |       | 71.2% |      | 1.7%  | 1.7% | 1.7%  |       |       |       | 1.7%  | 6.8%  |
| B1   | 6     |       |       |       |       |       |       |       |       |       |       | 16.7% | 33.3% | 50.0% |      |       |      |       |       |       |       |       |       |
| B2   | 180   |       |       |       |       |       |       |       |       |       |       | 1.1%  | 2.2%  | 3.3%  |      | 90.6% | 0.6% |       |       |       |       |       | 2.2%  |
| B3   | 29    |       |       |       |       |       |       |       |       |       |       |       |       | 6.9%  |      | 72.4% |      |       |       |       |       | 6.9%  | 6.9%  |
| Caa1 | 31    |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       |      | 80.6% |       |       |       |       | 19.4% |
| Caa2 | 10    |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       |      |       | 50.0% |       |       |       | 50.0% |
| Caa3 | 7     |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       |      |       |       | 71.4% |       |       | 28.6% |
| Ca   | 30    |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       |      |       |       |       | 63.3% | 3.3%  | 33.3% |
| C    | 7     |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       |      |       |       |       |       | 85.7% | 14.3% |

## **Related Research**

### **Special Comments**

Structured Finance Rating Transitions: 1983-2004, February 2005 (91392)

Structured Finance Rating Transitions: 1983-2003, February 2004 (81239)

Structured Finance Rating Transitions: 1983-2002, January 2003 (77291)

The Performance of Structured Finance Ratings: Mid-Year 2005 Report, September 2005 (94463)

The Relationship between Par Coupon Spreads and Credit Ratings in US Structured Finance, December 2005 (95494)

Default & Loss Rates of Structured Finance Securities: 1993-2004, July 2005 (93653)

Default & Loss Rates of U.S. CDOs: 1993-2003, March 2005 (91692)

Default & Loss Rates of Structured Finance Securities: 2004 First Half Update, January 2005 (90843)

Default & Loss Rates of Structured Finance Securities: 1993-2003, September 2004 (88692)

Structured Finance Watchlist Resolutions: 1992-2003, June 2004 (87305)

Measuring Loss Severity Rates Of Defaulted Residential Mortgage-Backed Securities: A Methodology, April 2004 (86769)

Payment Defaults and Material Impairments of U.S. Structured Finance Securities: 1993-2002, December 2003 (80247)

Guide to Moody's Default Research: January 2006 Update, January 2006 (96192)

The Performance of Moody's Corporate Bond Ratings: December 2005 Quarterly Update, January 2006 (96330)

Default and Recovery Rates of Corporate Bond Issuers, 1920-2004, January 2005 (91233)

Monthly Default Report - December 2005, January 2006 (96263)

### **Structured Finance Special Reports**

Rating Changes in the U.S. Asset-Backed Securities Market: 2005 Fourth Quarter Update, January 11, 2006 (SF67797)

Rating Changes in the U.S. Residential Mortgage-Backed Securities Market: 2005 Second Half Update, January 11, 2006 (SF67772)

Rating Changes in the U.S. Residential Mortgage-Backed Securities Market, 1988-2005: A Historical Review, September 9, 2005 (SF61061)

2005 Review and 2006 Outlook: US ABS Issuance Projected to Remain Strong in 2006, January 25, 2006 (SF68728)

2005 Review and 2006 Outlook: Private Label Jumbo RMBS Steady Market Now...But Will it Last?, January 25, 2006 (SF68733)

2005 Review and 2006 Outlook: Home Equity ABS Has Another Record Year; Will 2006 Offer Less?, January 24, 2006 (SF68235)

2005 Review and 2006 Outlook: Alternative-A RMBS Affordability Products Drive Growth, January 23, 2006 (SF68036)

2005 Review and 2006 Outlook EMEA Structured Finance: Strong Volume Growth in 2005 as Average Transaction Size Rises; Slower Growth in 2006, Supported by CMBS, New Asset Classes and Emerging Markets, January 25, 2006 (SF68802)

2005 Review and 2006 Outlook: Securitization Market in Japan, January 23, 2006 (SF68139)

2005 Review and 2006 Outlook Asian Structured Finance: Market Needs Further Diversity, and Opportunities Open in China, January 10, 2006 (SF67756)

2005 Review and 2006 Outlook: Latin American ABS/MBS Domestic Market Issuance Drives the Growth, while Cross-Border Issuance Takes a Backseat, January 18, 2006 (SF67927)

Third Quarter 2005 U.S. CDO Review: The Hectic Pace Continues, December 6, 2005 (SF65956)

U.S. CMBS 3Q 2005 Review: Conduit Leverage Levels Off in Moody's Rated Deals, October 31, 2005 (SF64478)

Rating Actions in the U.S. CDO Market: Year-to-Date Review - June 2005, August 19, 2005 (SF60719)

[Credit Migration of CDO Notes, 1996-2004, for US and European Transactions, March 10, 2005 \(SF52111\)](#)

[EMEA Structured Finance Rating Transitions: 2004 Update, February 22, 2005 \(SF51704\)](#)

[Japanese Structured Finance Rating Transitions: 1998-2004, April 8, 2005 \(SF53953\)](#)

*To access any of these reports, click on the entry above. Note that these references are current as of the date of publication of this report and that more recent reports may be available. All research may not be available to all clients.*

PAGE INTENTIONALLY LEFT BLANK

To order reprints of this report (100 copies minimum), please call 1.212.553.1658.  
Report Number: 96533

| <b>Author</b>     | <b>Senior Associate</b> | <b>Senior Production Associate</b> |
|-------------------|-------------------------|------------------------------------|
| <i>Julia Tung</i> | <i>Hadas Alexander</i>  | <i>Mark A. Lee</i>                 |

© Copyright 2006, Moody's Investors Service, Inc. and/or its licensors and affiliates including Moody's Assurance Company, Inc. (together, "MOODY'S"). All rights reserved. ALL INFORMATION CONTAINED HEREIN IS PROTECTED BY COPYRIGHT LAW AND NONE OF SUCH INFORMATION MAY BE COPIED OR OTHERWISE REPRODUCED, REPACKAGED, FURTHER TRANSMITTED, TRANSFERRED, DISSEMINATED, REDISTRIBUTED OR RESOLD, OR STORED FOR SUBSEQUENT USE FOR ANY SUCH PURPOSE, IN WHOLE OR IN PART, IN ANY FORM OR MANNER OR BY ANY MEANS WHATSOEVER, BY ANY PERSON WITHOUT MOODY'S PRIOR WRITTEN CONSENT. All information contained herein is obtained by MOODY'S from sources believed by it to be accurate and reliable. Because of the possibility of human or mechanical error as well as other factors, however, such information is provided "as is" without warranty of any kind and MOODY'S, in particular, makes no representation or warranty, express or implied, as to the accuracy, timeliness, completeness, merchantability or fitness for any particular purpose of any such information. Under no circumstances shall MOODY'S have any liability to any person or entity for (a) any loss or damage in whole or in part caused by, resulting from, or relating to, any error (negligent or otherwise) or other circumstance or contingency within or outside the control of MOODY'S or any of its directors, officers, employees or agents in connection with the procurement, collection, compilation, analysis, interpretation, communication, publication or delivery of any such information, or (b) any direct, indirect, special, consequential, compensatory or incidental damages whatsoever (including without limitation, lost profits), even if MOODY'S is advised in advance of the possibility of such damages, resulting from the use of or inability to use, any such information. The credit ratings and financial reporting analysis observations, if any, constituting part of the information contained herein are, and must be construed solely as, statements of opinion and not statements of fact or recommendations to purchase, sell or hold any securities. **NO WARRANTY, EXPRESS OR IMPLIED, AS TO THE ACCURACY, TIMELINESS, COMPLETENESS, MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OF ANY SUCH RATING OR OTHER OPINION OR INFORMATION IS GIVEN OR MADE BY MOODY'S IN ANY FORM OR MANNER WHATSOEVER.** Each rating or other opinion must be weighed solely as one factor in any investment decision made by or on behalf of any user of the information contained herein, and each such user must accordingly make its own study and evaluation of each security and of each issuer and guarantor of, and each provider of credit support for, each security that it may consider purchasing, holding or selling.

MOODY'S hereby discloses that most issuers of debt securities (including corporate and municipal bonds, debentures, notes and commercial paper) and preferred stock rated by MOODY'S have, prior to assignment of any rating, agreed to pay to MOODY'S for appraisal and rating services rendered by it fees ranging from \$1,500 to \$2,400,000. Moody's Corporation (MCO) and its wholly-owned credit rating agency subsidiary, Moody's Investors Service (MIS), also maintain policies and procedures to address the independence of MIS's ratings and rating processes. Information regarding certain affiliations that may exist between directors of MCO and rated entities, and between entities who hold ratings from MIS and have also publicly reported to the SEC an ownership interest in MCO of more than 5%, is posted annually on Moody's website at [www.moody's.com](http://www.moody's.com) under the heading "Shareholder Relations — Corporate Governance — Director and Shareholder Affiliation Policy."

Moody's Investors Service Pty Limited does not hold an Australian financial services licence under the Corporations Act. This credit rating opinion has been prepared without taking into account any of your objectives, financial situation or needs. You should, before acting on the opinion, consider the appropriateness of the opinion having regard to your own objectives, financial situation and needs.



| Contact                 | Phone           |
|-------------------------|-----------------|
| <b><u>New York</u></b>  |                 |
| Julia Tung              | 1.212.553.1653  |
| Jian Hu                 |                 |
| Richard Cantor          |                 |
| Nicolas Weill           |                 |
| Gus Harris              |                 |
| Tad Philipp             |                 |
| <b><u>London</u></b>    |                 |
| David Rosa              | 44.20.7772.5454 |
| <b><u>Frankfurt</u></b> |                 |
| Detlef Scholz           | 49.69.70730.700 |
| <b><u>Paris</u></b>     |                 |
| Paul Mazataud           | 33.1.5330.1020  |

## Structured Finance Rating Transitions: 1983-2006

### Summary Opinion

This is Moody's fifth annual global structured finance rating transitions study. We review the 2006 and historical transition rates both on an aggregate basis and within key asset classes and provide comparisons to the corporate rating transition experience.

Global structured finance securities continued to experience positive rating transition trends in 2006. The 12-month downgrade rate remained below the historical average, the upgrade rate above the historical average, and migration rates into Caa or below were still low. This pattern held for almost all sectors and regions of the structured finance market.

**Figure 1 –Global Structured Finance 12-Month Downgrade and Upgrade Rates by Sector in 2006, 2005, and Averaged over 1997-2006**

|                                   | 12-Month Downgrade Rate |      |           | 12-Month Upgrade Rate |       |           |
|-----------------------------------|-------------------------|------|-----------|-----------------------|-------|-----------|
|                                   | 2006                    | 2005 | 1997-2006 | 2006                  | 2005  | 1997-2006 |
| US ABS                            | 2.6%                    | 1.8% | 5.0%      | 3.1%                  | 2.8%  | 1.9%      |
| US HEL                            | 2.5%                    | 1.8% | 2.9%      | 2.2%                  | 1.7%  | 1.4%      |
| US Autos                          | 0.0%                    | 0.0% | 1.5%      | 31.0%                 | 13.1% | 8.5%      |
| US Credit Cards                   | 0.1%                    | 0.0% | 0.8%      | 5.8%                  | 4.0%  | 2.0%      |
| US Student Loans                  | 0.0%                    | 0.0% | 0.0%      | 1.8%                  | 4.4%  | 1.1%      |
| US non-mortgage ABS               | 1.7%                    | 2.2% | 4.5%      | 7.1%                  | 4.0%  | 2.4%      |
| US CDOs                           | 3.2%                    | 3.0% | 9.0%      | 3.6%                  | 1.6%  | 1.2%      |
| US HY CBOs                        | 7.3%                    | 1.2% | 19.4%     | 12.8%                 | 4.8%  | 2.2%      |
| US HY CLOs                        | 0.7%                    | 0.2% | 2.1%      | 2.5%                  | 0.5%  | 0.7%      |
| US Resecuritization CDOs          | 3.8%                    | 9.6% | 8.2%      | 2.6%                  | 1.6%  | 1.0%      |
| US Synthetic Arbitrage CDOs       | 4.7%                    | 1.6% | 8.5%      | 1.5%                  | 0.3%  | 0.5%      |
| US CMBS                           | 2.0%                    | 3.4% | 3.3%      | 22.3%                 | 15.7% | 10.7%     |
| US RMBS                           | 0.4%                    | 0.9% | 0.6%      | 3.8%                  | 6.6%  | 5.1%      |
| US Structured Finance             | 2.0%                    | 2.0% | 3.9%      | 6.0%                  | 5.7%  | 4.1%      |
| EMEA Structured Finance           | 1.6%                    | 2.0% | 4.1%      | 3.7%                  | 7.3%  | 3.9%      |
| Asia-Pacific Structured Finance   | 1.5%                    | 0.4% | 1.5%      | 6.8%                  | 7.6%  | 5.9%      |
| Latin American Structured Finance | 4.1%                    | 1.9% | 10.5%     | 24.4%                 | 2.9%  | 6.4%      |
| Global Structured Finance         | 1.9%                    | 2.0% | 3.8%      | 5.8%                  | 6.0%  | 4.1%      |
| Global Corporate                  | 8.9%                    | 8.3% | 13.0%     | 13.0%                 | 13.9% | 9.8%      |

*Note: Canadian structured finance securities are included in the calculation of US transition rates. Non-mortgage ABS excludes transactions backed by subprime and home equity mortgages and manufactured housing loans. EMEA includes countries in Europe, the Middle East, and Africa. Global corporate transition rates include international corporate and sovereign issuers, but exclude US municipal ratings. For more details, see the Glossary in the Appendix.*

Key findings in the report include:

- The global structured finance market experienced approximately three rating upgrades per rating downgrade in 2006, the same ratio as in 2005, and well above the historical average of roughly 1:1. Overall, 709 ratings from 438 deals were downgraded and 2161 ratings from 826 deals were upgraded. The 12-month downgrade rate decreased slightly to 1.9% in 2006 from 2.0% the previous year, while the upgrade rate also declined to 5.8% from 6.0%.
- The average number of notches lowered over the year per downgraded security also fell from 3.2 notches in 2005 to 3.0 notches in 2006; meanwhile, the average magnitude of upgrades rose from 2.4 notches to 2.6 notches.
- As in 2005, frequencies of transitions into the Caa or below rating category in 2006 were low for all rating categories and much below their historical averages.
- The frequency of both positive and negative rating actions increased for US ABS in 2006, but similar to 2005, the upgrade rate at 3.1% was still higher than the downgrade rate of 2.6%. Securities backed by subprime mortgages and manufactured housing loans accounted for 87% of the downgrades. As the largest asset type within ABS, the home equity sector (HEL) also made up the largest percentage of upgrades. Excluding HEL, securities backed by auto loans, which experienced an impressive 31.0% upgrade rate in 2006, contributed the most to US ABS upgrade activity.
- The US HEL sector experienced negative rating drift in 2006 as downgrades exceeded upgrades by a ratio of 1.2:1, compared to a ratio of 1:1 in 2005. However, the downgrade rate was still under the historical average and the upgrade rate above the average. There were a variety of factors behind the home equity downgrades including poor performance of the underlying collateral, weaknesses in the structure of the transactions, and excess spread compression.
- US CDOs enjoyed another strong year as the downgrade rate was essentially flat at 3.2%, far below the 10-year historical average of 9.0%, and the upgrade rate rose to a ten-year high of 3.6%. Resecuritization CDOs and high-yield CBOs (HY CBOs) made up approximately two-thirds of both downgrades and upgrades for the US CDO market.
- After a record-breaking year for upgrades in 2005, the US CMBS upgrade rate reached a new high of 22.3% in 2006. At the same time, the downgrade rate dropped to a four-year low of 2.0%. Elevated levels of commercial property price appreciation and the resulting wave of refinancing and defeasance were major factors behind the upgrades.
- High prepayment rates and low losses among pools of prime residential mortgages also led to a high upgrade-to-downgrade ratio for US RMBS in 2006. While the frequency of upgrades declined to 3.8% from 6.6% in 2005, the frequency of downgrades fell even further to 0.4% from 0.9%.
- International structured finance securities also exhibited strong performance in 2006. Upgrade-to-downgrade ratios for EMEA, the Asia-Pacific region, and Latin America were 2.4, 4.4, and 6.0 respectively.
- Upgrades outnumbered downgrades in the global credit derivatives sector in 2006 for the first time in almost four years. Structured notes – which generally experience rating changes whenever the ratings on the underlying reference credits change – accounted for most of the downgrade and upgrade activity in this sector.

---

---

# Table of Contents

---

|   | Page |
|---|------|
| <i>Summary Opinion</i> .....                                      | 1    |
| <i>An Overview of Rating Transitions in 2006</i> .....            | 4    |
| Analysis of Rating Transition Trends .....                        | 5    |
| Comparison to Corporate Rating Transitions .....                  | 7    |
| <i>Sector Specific Analysis of US Rating Transitions</i> .....    | 10   |
| US ABS .....  | 10   |
| US ABS Backed by Home Equity Loans (HEL) .....                    | 14   |
| US CDOs .....   | 17   |
| US CMBS .....   | 20   |
| US RMBS .....   | 22   |
| <i>Regional Comparisons of Rating Transitions</i> .....           | 25   |
| EMEA and US Rating Transition Rates .....                         | 25   |
| Asia-Pacific and US Rating Transition Rates .....                 | 26   |
| Latin America and US Rating Transition Rates .....                | 28   |
| <i>Rating Transitions in the Derivatives Sector</i> .....         | 31   |
| <i>Appendix I: Description of Data Sample and Glossary</i> .....  | 33   |
| Description of Data Sample .....                                  | 33   |
| Glossary .....  | 33   |
| <i>Appendix II: Methodology</i> .....                             | 36   |
| Computation of Rating Transition Statistics .....                 | 36   |
| Adjusting for Withdrawn Ratings (WR) .....                        | 36   |
| Counting Downgrades and Upgrades .....                            | 37   |
| <i>Appendix III: Multi-Year Horizon Transition Matrices</i> ..... | 39   |
| Matrices by Cohort Rating .....                                   | 39   |
| Matrices by Original Rating .....                                 | 64   |
| <i>Related Research</i> .....                                     | 72   |

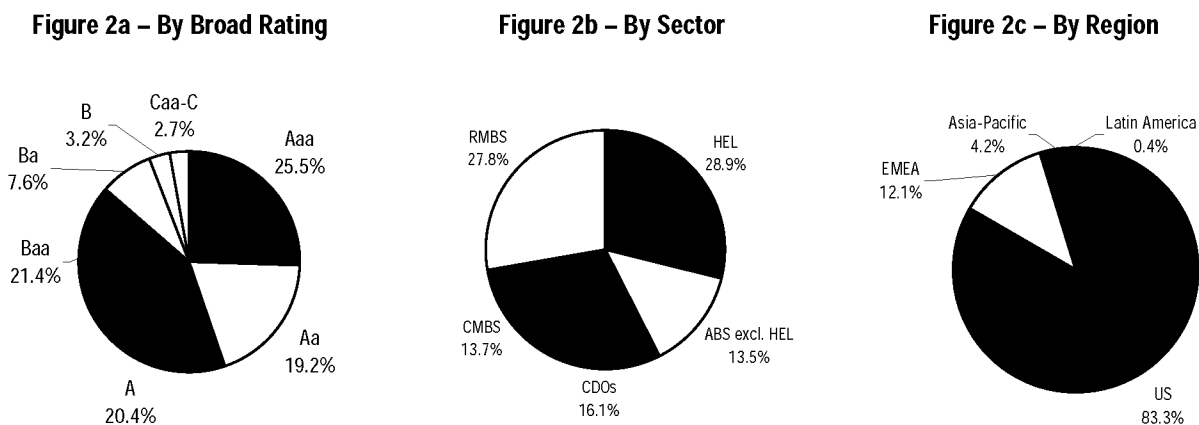
## An Overview of Rating Transitions in 2006

The year 2006 saw the continuation of the positive rating transition trends experienced by the global structured finance market in 2005. Both the 12-month downgrade and upgrade rates experienced minor declines relative to the year-prior levels, but the frequency of downgrades remained well below its historical average and the frequency of upgrades above its historical average. All four major sectors of structured finance in the US, as well as the international structured finance markets, experienced more upgrades than downgrades in 2006, usually by a wide margin. However, the slowing US housing market and rising interest rate environment negatively affected US home equity securitizations within the ABS sector, as the downgrade rate for these transactions was on a rising trend for most of 2006.

In this section we discuss rating transitions for the entire structured finance market, combining the ABS, CDO, CMBS, and RMBS sectors across all regions, but excluding derivative securities such as structured notes, repackaged securities, and structured covered bonds. Detailed rating transitions data for each of the four sectors in the US are presented later in the report. Rating transitions in EMEA (Europe, the Middle East, and Africa), the Asia-Pacific region and Latin America, as well as the global derivatives sector, are also analyzed later in the report.<sup>1</sup> Multi-year horizon transition matrices can be found in the Appendix.

At the beginning of 2006, there were 38,187 global structured finance ratings outstanding from 10,341 deals.<sup>2</sup> The structured finance market remained heavily weighted towards investment-grade ratings with 86.5% of outstanding securities carrying a rating of Baa or higher and approximately a quarter rated Aaa (Figure 2a). The relative ranking of each of the four sectors of structured finance remained unchanged from prior years with ABS (including the home equity or HEL sector) still the largest sector (42.4%), followed by RMBS (27.8%), CDOs (16.1%), and CMBS (13.7%) (Figure 2b). Furthermore, the US<sup>3</sup> still dominated the global structured finance market accounting for 83.3% of all ratings (Figure 2c), a slight increase over its percentage share in 2005.

**Figure 2 – Distribution of Outstanding Structured Finance Ratings on 1/1/2006**



Over the course of 2006, 709 ratings from 438 deals were downgraded and 2161 ratings from 826 deals were upgraded in the global structured finance market.<sup>4</sup> As the largest structured finance sector, ABS also took the largest share of downgrades with a combined total of 52.9%, consisting mostly of home equity downgrades (Figure 3a). CDOs accounted for the second largest proportion of downgrades with a 28.6% share.

Upgrades were concentrated in the CMBS sector, which represented almost half of all structured finance upgrades in 2006 despite making up less than 14% of all ratings (Figure 3b). Although the number of ABS and CDO upgrades increased relative to 2005, their shares of the total were unchanged due to the dominance of CMBS in upgrade activity.

1. Moody's also publishes separate rating transition studies for the EMEA region and the Asia Pacific region ex-Japan (forthcoming).

2. See Appendix I for details on the construction of the data sample.

3. Canadian structured finance securities are included in the US total. There were 109 Canadian structured finance ratings outstanding as of 1/1/2006, representing only 0.34% of total US ratings.

4. In counting downgrades and upgrades, we only consider ratings at the beginning and the end of the year. All downgrade and upgrade rates are adjusted for withdrawals by deducting half of the withdrawn ratings from the total number of ratings outstanding at the beginning of the cohort formation date. See Appendix II for more details.

### Figure 3 - Distribution of Structured Finance Rating Changes in 2006

Figure 3a - Downgrades by Sector

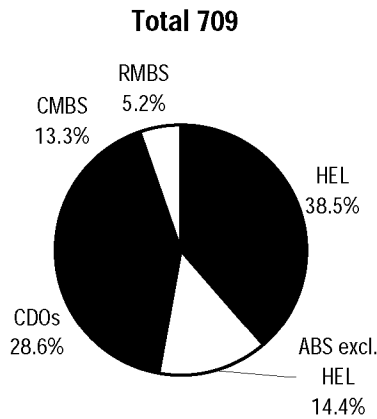
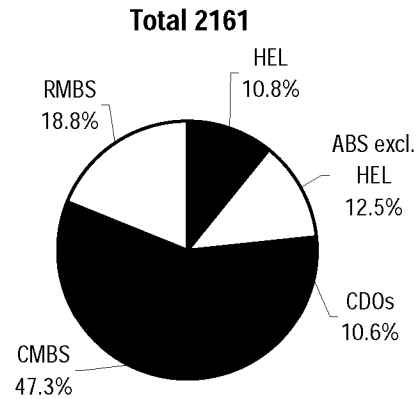


Figure 3b - Upgrades by Sector



The bulk of the downgrades in 2006 were caused by weaker-than-anticipated performance of the underlying collateral, although in some home equity transactions, structural weaknesses and declines in excess spread were the basis of the negative rating actions.

Most upgrades were due to increased credit support from loan and note amortization and/or stable or improving collateral performance. For some CDOs, a reduced time to maturity was sufficient grounds for an upgrade. A small percentage of rating changes were prompted by changes in the rating of a related third party or by structural changes to the transaction.

#### ANALYSIS OF RATING TRANSITION TRENDS

Both the 12-month downgrade and upgrade rates for global structured finance securities ticked downwards in 2006 leaving the downgrade-to-upgrade ratio unchanged relative to 2005 at 0.3. The frequency of downgrades for 2006 was 1.9%, down slightly from 2.0% in 2005 and less than half the historical average of 4.4% (Figures 4a and 5). The upgrade rate also dipped from 6.0% in 2005 to 5.8% in 2006, but remained well above the historical average of 3.7%. As a result, the rating drift - defined as the weighted upgrade rate minus the weighted downgrade rate - remained strongly positive at 9.4%, up from 8.2% last year (Figure 4c).

The average magnitude of rating downgrades, measured as the average number of notches changed in the course of a 12-month period per downgraded security, also fell slightly to 3.0 notches from 3.2 in 2005, while the magnitude of upgrades bumped upwards from 2.4 notches to 2.6 notches (Figure 4b).

Investment-grade and below investment-grade securities followed somewhat divergent trends in 2006 (Figure 4d). The downgrade rate was flat for investment-grade securities at 1.3%, whereas the rate declined for speculative-grade securities to 5.9% from 6.1%. The upgrade rate also went in opposite directions, decreasing from 6.4% in 2005 to 5.9% in 2006 for investment-grade securities and increasing from 3.8% to 5.2% for speculative-grade securities.

## Figure 4 – Rating Transition Trends for Global Structured Finance

Figure 4a – 12-month Downgrade Rates and Upgrade Rates

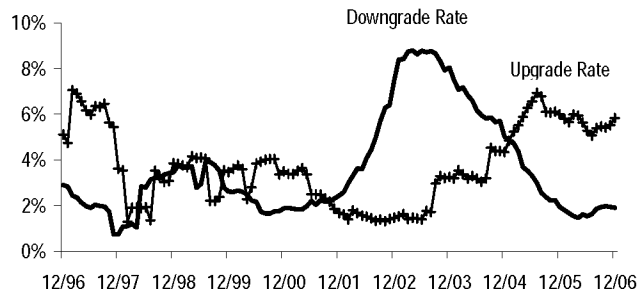


Figure 4b – Magnitude of Downgrades and Upgrades

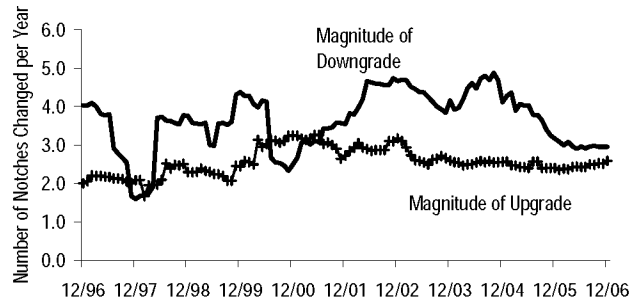


Figure 4c – Rating Drift and Rating Volatility

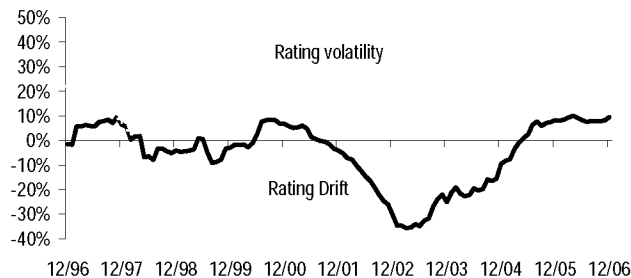
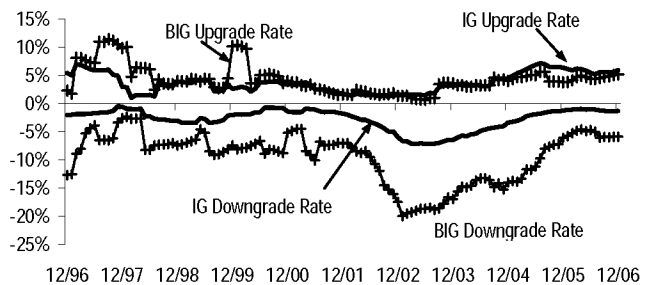


Figure 4d – Investment Grade (IG) and Below IG Downgrade and Upgrade Rates (downgrades marked negative)



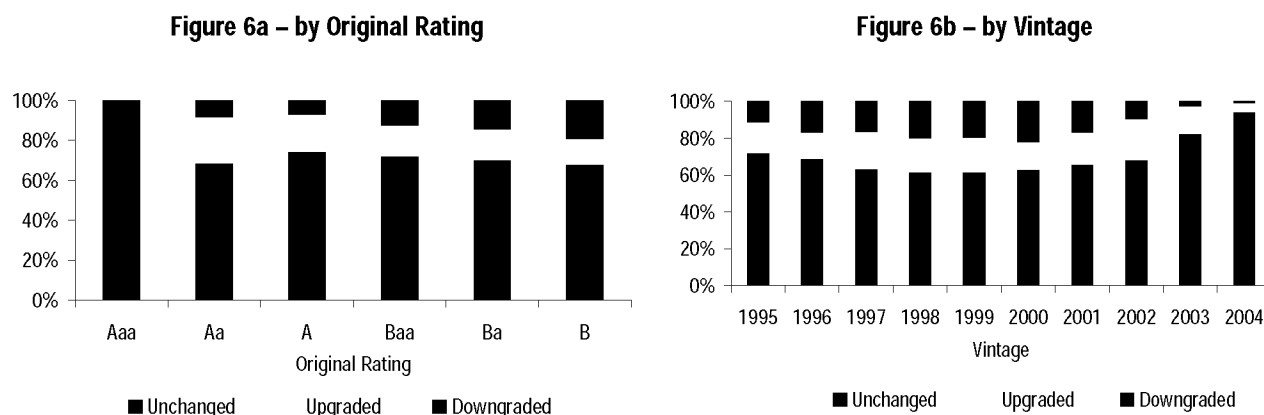
Note: The horizontal axis represents the cohort ending date.

| Figure 5 – Summary of 12-month Rating Transitions for Global Structured Finance |        |        |           |           |
|---|--------|--------|-----------|-----------|
|   | 2006   | 2005   | 1997-2006 | 1997-2005 |
| Downgrade Rate  | 1.92%  | 1.95%  | 3.82%     | 4.44%     |
| Upgrade Rate  | 5.84%  | 6.01%  | 4.13%     | 3.68%     |
| Downgrade/Upgrade ratio   | 0.33   | 0.32   | 0.92      | 1.20      |
| Downgrade Rate (notch weighted)   | 5.66%  | 6.18%  | 15.31%    | 18.37%    |
| Upgrade Rate (notch weighted)   | 15.10% | 14.41% | 10.40%    | 9.40%     |
| Downgrade/Upgrade ratio (notch weighted)  | 0.37   | 0.43   | 1.47      | 1.95      |
| Rating Drift (notch weighted)   | 9.44%  | 8.23%  | -4.91%    | -8.97%    |
| Rating Volatility (notch weighted)  | 20.76% | 20.59% | 25.71%    | 27.76%    |
| Stability Rate  | 92.25% | 92.04% | 92.06%    | 91.87%    |
| Withdrawal Rate   | 6.16%  | 9.52%  | 8.75%     | 8.95%     |
| Notches per Downgrade per Year  | 2.95   | 3.17   | 3.68      | 3.89      |
| Notches per Upgrade per Year  | 2.59   | 2.40   | 2.58      | 2.61      |

Lifetime cumulative downgrade rates were generally rank-ordered by original rating with Aaa-rated securities experiencing the lowest incidence of lifetime downgrades and single-B the greatest (Figure 6a). Moreover, cumulative upgrade rates were also rank-ordered by original rating with Aa-rated tranches experiencing the highest lifetime upgrade rate of 22.8%.

Credit performance has been disparate for deals issued in different years (Figure 6b). At the negative end of the spectrum, the lifetime downgrade-to-upgrade ratio for the 2000 vintage was 1.5 due to the relatively high proportion of poorly performing MH ABS, HY CBOs, and CMBS issued in that year. At the positive end of the spectrum, the lifetime downgrade-to-upgrade ratio for the 2002 vintage was 0.4 due mostly to the fact that US RMBS and CMBS transactions that closed in 2002 experienced a very strong housing market during the early years of their lives.

**Figure 6 – Cumulative Rating Transition Rates for Global Structured Finance pre-2005 vintages, 1984-2006**



**COMPARISON TO CORPORATE RATING TRANSITIONS**

Both the structured finance and corporate finance markets enjoyed historically low downgrade rates and historically high upgrade rates in 2006, leading to strongly positive rating drifts for both markets compared to their negative historical averages (Figure 7). It was still the case in 2006 that rating changes are much more common in the corporate sector leading to a much lower stability rate of 78.1% versus 92.3% for structured finance ratings. However, once a rating change did occur, the average magnitude of the rating movement for structured finance was almost two times larger than the average number of notches changed for corporate downgrades and upgrades.

|  | Global Structured Finance |           | Global Corporate Finance |           |
|--|---------------------------|-----------|--------------------------|-----------|
|  | 2006                      | 1984-2006 | 2006                     | 1984-2006 |
| Downgrade Rate                           | 1.92%                     | 3.86%     | 8.91%                    | 13.18%    |
| Upgrade Rate                             | 5.84%                     | 4.19%     | 13.01%                   | 8.95%     |
| Downgrade/Upgrade ratio                  | 0.33                      | 0.92      | 0.69                     | 1.47      |
| Downgrade Rate (notch weighted)          | 5.66%                     | 14.89%    | 12.88%                   | 23.95%    |
| Upgrade Rate (notch weighted)            | 15.10%                    | 10.25%    | 18.77%                   | 13.68%    |
| Downgrade/Upgrade ratio (notch weighted) | 0.37                      | 1.45      | 0.69                     | 1.75      |
| Rating Drift (notch weighted)            | 9.44%                     | -4.64%    | 5.89%                    | -10.27%   |
| Rating Volatility (notch weighted)       | 20.76%                    | 25.14%    | 31.65%                   | 37.62%    |
| Stability Rate                           | 92.25%                    | 91.95%    | 78.08%                   | 77.86%    |
| Withdrawal Rate                          | 6.16%                     | 8.41%     | 7.25%                    | 5.92%     |
| Notches per Downgrade per Year           | 2.95                      | 3.59      | 1.44                     | 1.78      |
| Notches per Upgrade per Year             | 2.59                      | 2.49      | 1.44                     | 1.54      |

Although both structured finance and corporate finance downgrade rates peaked in late 2002 to mid-2003, their paths have deviated since then. The structured finance downgrade rate has been on a prolonged decline over the last three years while the corporate downgrade rate has been creeping upwards in the last year (Figure 8a). On the other hand, upgrade rates for the structured finance and corporate sectors have followed a very similar pattern, cresting around mid-2005 and still fluctuating at historically high levels (Figure 8b).

## Figure 8 – Comparison of Global Structured Finance and Corporate Finance Downgrade and Upgrade Rates

Figure 8a – Downgrade Rates

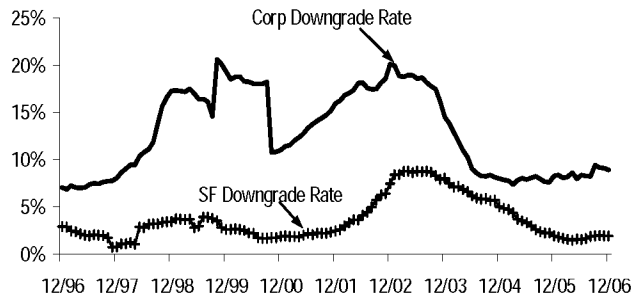
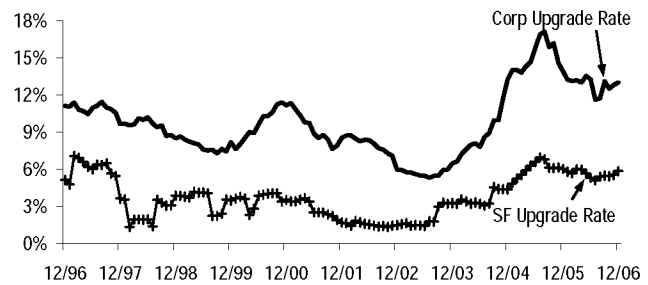


Figure 8b – Upgrade Rates



Note: The horizontal axis represents the cohort ending date.

Figure 9 compares the 12-month rating transition matrices for global structured finance and global corporate finance in 2006 and averaged over the period 1984 to 2006. For the 2006 cohort, Baa, Ba, and single-B corporate ratings were less stable than their structured counterparts because they had both higher downgrade and upgrade rates; Aa and single-A structured ratings were less stable due to higher upgrade frequencies. In addition, Aaa-rated structured finance securities were more stable than their corporate counterparts.

The same broad conclusions hold for the historical average rating transitions. However, migration rates into the Caa or below rating category were similar in 2006 for the structured finance and corporate sectors, unlike in the past when structured finance securities experienced higher downgrade rates into the lowest rating category.



**Figure 9 – Global Structured Finance and Global Corporate Finance 12-month Rating Transition Matrices**

| Structured Finance in 2006                   |        | Ratings to: |        |        |        |        |              |
|--|--------|-------------|--------|--------|--------|--------|--------------|
| Ratings from:                                | Aaa    | Aa          | A      | Baa    | Ba     | B      | Caa or below |
| Aaa  | 99.80% | 0.16%       | 0.02%  | 0.02%  |        |        |              |
| Aa   | 6.40%  | 93.01%      | 0.50%  | 0.06%  | 0.01%  | 0.01%  |              |
| A  | 2.02%  | 5.12%       | 91.79% | 0.90%  | 0.11%  | 0.07%  |              |
| Baa  | 0.46%  | 0.81%       | 4.09%  | 92.26% | 1.39%  | 0.73%  | 0.25%        |
| Ba   | 0.32%  | 0.07%       | 0.63%  | 4.04%  | 92.34% | 1.69%  | 0.91%        |
| B  |        | 0.08%       | 0.34%  | 0.42%  | 3.37%  | 88.81% | 6.98%        |
| Caa or below                                 |        |             |        | 0.10%  | 0.10%  | 0.72%  | 99.07%       |
| <b>Structured Finance: 1984-2006 average</b> |        |             |        |        |        |        |              |
| Ratings from:                                | Aaa    | Aa          | A      | Baa    | Ba     | B      | Caa or below |
| Aaa  | 98.95% | 0.70%       | 0.20%  | 0.06%  | 0.03%  | 0.02%  | 0.03%        |
| Aa   | 5.74%  | 91.56%      | 1.79%  | 0.56%  | 0.13%  | 0.08%  | 0.13%        |
| A  | 1.28%  | 3.59%       | 92.38% | 1.78%  | 0.52%  | 0.21%  | 0.24%        |
| Baa  | 0.35%  | 0.57%       | 3.04%  | 91.66% | 2.37%  | 1.01%  | 1.00%        |
| Ba   | 0.10%  | 0.09%       | 0.55%  | 3.17%  | 88.74% | 3.23%  | 4.11%        |
| B  | 0.06%  | 0.04%       | 0.11%  | 0.41%  | 2.22%  | 87.39% | 9.78%        |
| Caa or below                                 | 0.02%  |             |        | 0.04%  | 0.09%  | 0.38%  | 99.47%       |
| <b>Corporate Finance in 2006</b>             |        |             |        |        |        |        |              |
| Ratings from:                                | Aaa    | Aa          | A      | Baa    | Ba     | B      | Caa or below |
| Aaa  | 97.95% | 1.54%       | 0.51%  |        |        |        |              |
| Aa   | 1.35%  | 97.63%      | 1.01%  |        |        |        |              |
| A  | 0.47%  | 3.08%       | 93.16% | 3.15%  | 0.13%  |        |              |
| Baa  | 0.08%  | 0.17%       | 6.09%  | 89.85% | 2.71%  | 0.93%  | 0.17%        |
| Ba   |        | 0.17%       | 0.17%  | 8.99%  | 80.81% | 8.82%  | 1.04%        |
| B  |        |             | 0.24%  | 0.12%  | 10.55% | 80.47% | 8.63%        |
| Caa or below                                 |        |             |        |        |        | 22.86% | 77.14%       |
| <b>Corporate Finance: 1984-2006 average</b>  |        |             |        |        |        |        |              |
| Ratings from:                                | Aaa    | Aa          | A      | Baa    | Ba     | B      | Caa or below |
| Aaa  | 92.76% | 6.92%       | 0.29%  |        | 0.02%  | 0.00%  |              |
| Aa   | 0.88%  | 91.86%      | 6.90%  | 0.29%  | 0.05%  | 0.02%  | 0.01%        |
| A  | 0.06%  | 2.59%       | 91.45% | 5.18%  | 0.57%  | 0.12%  | 0.04%        |
| Baa  | 0.05%  | 0.24%       | 5.21%  | 88.52% | 4.47%  | 1.00%  | 0.52%        |
| Ba   | 0.01%  | 0.07%       | 0.54%  | 6.08%  | 82.40% | 8.88%  | 2.02%        |
| B  | 0.01%  | 0.05%       | 0.19%  | 0.42%  | 6.01%  | 82.04% | 11.27%       |
| Caa or below                                 |        | 0.03%       | 0.04%  | 0.21%  | 0.67%  | 9.45%  | 89.59%       |

## Sector Specific Analysis of US Rating Transitions

### US ABS

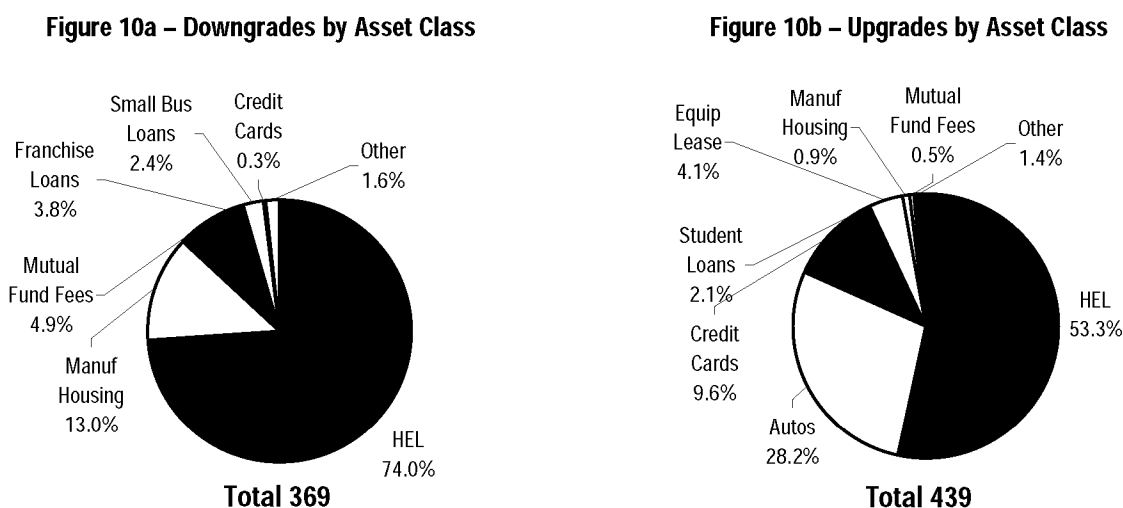
Out of a total universe of 14,700 US ABS ratings from 3,256 deals outstanding at the beginning of 2006, 369 ratings from 207 deals were downgraded and 439 ratings from 213 deals were upgraded in 2006. Given that the home equity sector accounted for 75% of US ABS ratings at the beginning of the year, it is not surprising that HEL rating actions dominated both the list of downgrades (74.0%) and upgrades (53.3%) (Figure 10).

After a relatively quiet 2005, the manufactured housing (MH) sector experienced an increase in downgrade activity in 2006, accounting for 13.0% of US ABS downgrades for the year. 41 of the 48 MH downgrades affected deals issued by Conseco/Green Tree and were caused by the continued poor performance of the pools and the resulting erosion in credit support.<sup>5</sup> All but two of these tranches had been downgraded previously. Transactions backed by mutual fund fees accounted for the third largest percentage of downgrades at 5%. Some of these deals have experienced declines in cash flow as the mutual fund pools comprising the asset base for the transactions become more seasoned, and eventually graduate off of fee schedules.<sup>6</sup>

Transactions backed by franchise loans and small business loans also experienced a bump in downgrade activity in the latter half of the year due to weak collateral performance. Tranches issued out of Falcon Franchise Loan Trust 2000-1, a securitization of franchise automobile dealership loans, were downgraded for the first time in 2006.<sup>7</sup> All other securities downgraded in 2006 in the franchise loan and small business loans sectors had also been downgraded in the past.

Auto loan securitizations experienced two rounds of rating upgrades in 2006 to take the second largest share of US ABS upgrades (28.2%) after HEL. These deals have benefited from a build-up of credit enhancement due in part to structural features such as the inclusion of non-declining enhancements and the initial trapping of excess spread.<sup>8</sup> The credit card sector, also a strong performer historically, accounted for third largest proportion of upgrades (9.6%). Transactions backed by equipment leases also performed well in 2006 with 18 upgrades and no downgrades. Similarly, the student loan sector experienced 9 upgrades and zero downgrades. For both the equipment lease and student loan sectors, upgrades were triggered by better than expected performance of the underlying collateral and a build-up in credit enhancement.

**Figure 10 - Distribution of US ABS Rating Changes in 2006**



5. See the related Moody's press release, "Moody's confirms, upgrades and downgrades various manufactured housing certificates," August 2, 2006.

6. See the related Moody's press release, "Moody's Investors Service downgraded its ratings on several Constellation mutual fund fee deals," May 8, 2006.

7. See the related Moody's press release, "Moody's downgrades six classes and confirms two classes of Falcon Franchise Loan Trust Certificates, Series 2000-1," November 16, 2006.

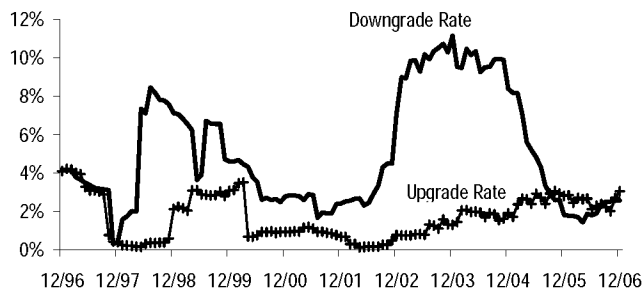
8. See the related Moody's press releases, "Moody's upgrades and confirms 69 tranches from 45 auto loan-backed securitizations," March 31, 2006 and "Moody's upgrades numerous tranches from several auto loan-backed securitizations," November 28, 2006.

For the US ABS sector in 2006 (see Figures 11 and 12):

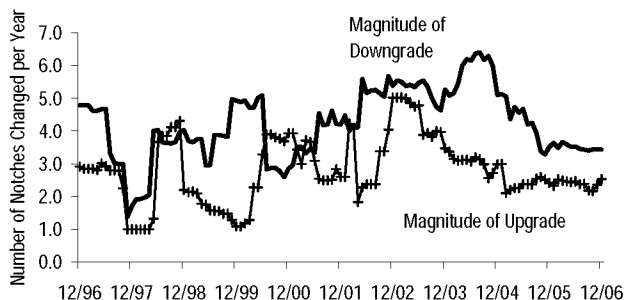
- The frequency of both downgrades and upgrades increased in 2006 relative to 2005, to 2.6% from 1.8% for downgrades and to 3.1% from 2.8% for upgrades. However, the downgrade rate was still well below its historical average of 5.9% and the upgrade rate was still higher than its historical average of 1.7%.
- The magnitudes of rating downgrades and upgrades changed little over the course of the year, falling slightly for downgrades from 3.5 notches in 2005 to 3.4 notches in 2006 and rising slightly for upgrades from 2.4 notches to 2.5 notches.
- After briefly rising above zero at the end of 2005, the rating drift turned negative in May 2006 where it has stayed for the rest of the year. Rating stability declined and rating volatility grew to 16.6% from 13.3% in 2005.
- The pattern of rating migration rates for investment-grade and below investment-grade US ABS was similar in 2006. The downgrade rates for investment-grade and speculative-grade securities increased moderately, while the upgrade rates increased around 10% on a year-over-year basis.<sup>9</sup>

### Figure 11 – Rating Transition Trends for US ABS

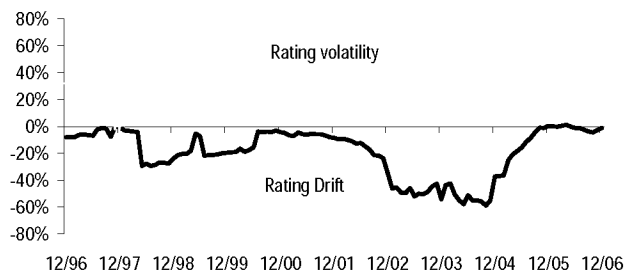
**Figure 11a – 12-month Downgrade Rates and Upgrade Rates**



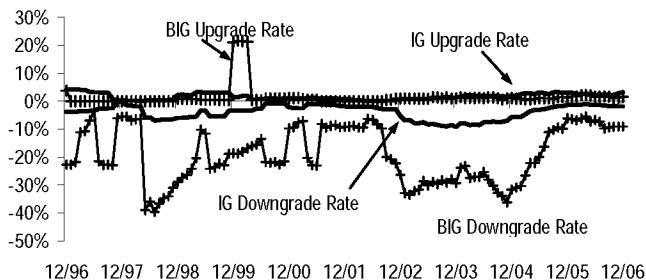
**Figure 11b – Magnitude of Downgrades and Upgrades**



**Figure 11c – Rating Drift and Rating Volatility**



**Figure 11d – Investment Grade (IG) and Below IG Downgrade and Upgrade Rates (downgrades marked negative)**



Note: The horizontal axis represents the cohort ending date.

9. The spike in the below investment-grade upgrade rate in late 1999 was caused by the upgrades of the subordinate guaranteed tranches of several Conseco manufactured housing and home equity deals due to the upgrade of Conseco Finance Corp.'s rating.

| <b>Figure 12 – Summary of 12-month Rating Transitions for US ABS</b> |             |             |                  |                  |
|--|-------------|-------------|------------------|------------------|
|  | <b>2006</b> | <b>2005</b> | <b>1997-2006</b> | <b>1997-2005</b> |
| Downgrade Rate   | 2.58%       | 1.83%       | 4.99%            | 5.90%            |
| Upgrade Rate   | 3.06%       | 2.83%       | 1.86%            | 1.65%            |
| Downgrade/Upgrade ratio  | 0.84        | 0.65        | 2.68             | 3.57             |
| Downgrade Rate (notch weighted)                                      | 8.85%       | 6.43%       | 24.04%           | 29.30%           |
| Upgrade Rate (notch weighted)  | 7.78%       | 6.85%       | 4.84%            | 4.46%            |
| Downgrade/Upgrade ratio (notch weighted)                             | 1.14        | 0.94        | 4.96             | 6.57             |
| Rating Drift (notch weighted)  | -1.07%      | 0.41%       | -19.20%          | -24.84%          |
| Rating Volatility (notch weighted)                                   | 16.63%      | 13.28%      | 28.88%           | 33.76%           |
| Stability Rate   | 94.36%      | 95.35%      | 93.15%           | 92.45%           |
| Withdrawal Rate  | 5.07%       | 10.64%      | 8.84%            | 9.03%            |
| Notches per Downgrade per Year                                       | 3.44        | 3.53        | 4.32             | 4.58             |
| Notches per Upgrade per Year   | 2.54        | 2.42        | 2.82             | 2.96             |

US ABS that were originally rated below investment-grade had much higher rates of downgrades than those rated investment grade (Figure 13a). Although the ratio of cumulative downgrades to upgrades has changed from year to year, there have not been huge variations in performance among deals issued between 1995 and 2002 (Figure 13b). For all these vintages, downgrades have outnumbered upgrades, while the opposite is true for the 2003 and 2004 vintages.

**Figure 13 – Cumulative Rating Transition Rates for US ABS pre-2005 vintages, 1984-2006**

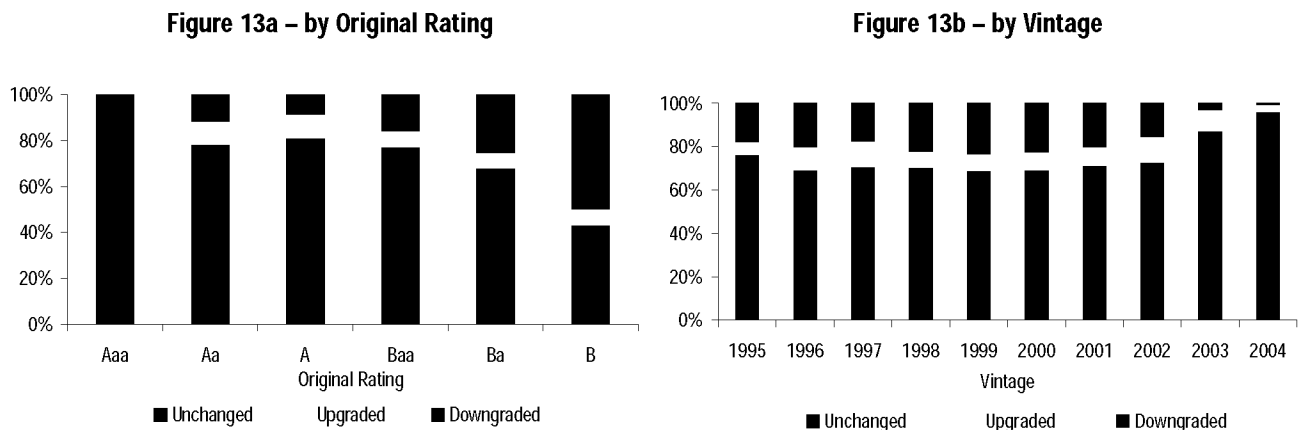
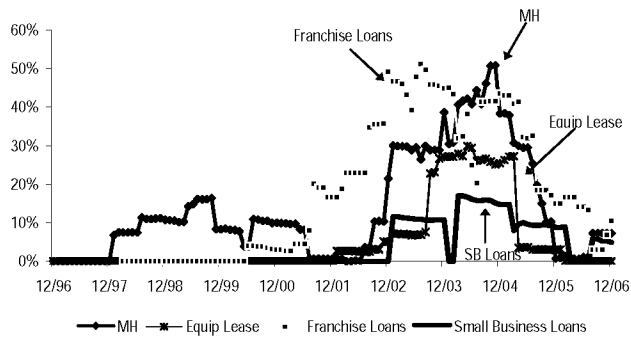


Figure 14 exhibits the 12-month downgrade and upgrades rates for a few select ABS asset classes. While downgrade rates for the MH, franchise loan, and small business loan sectors were clearly down from their highs of previous years, they all experienced an uptick in downgrade activity towards the end of 2006 (Figure 14a). Upgrade activity has also been low to non-existent for these three sectors (Figure 14c). ABS backed by equipment leases improved tremendously in 2006 with no downgrades and a jump in the upgrade rate.

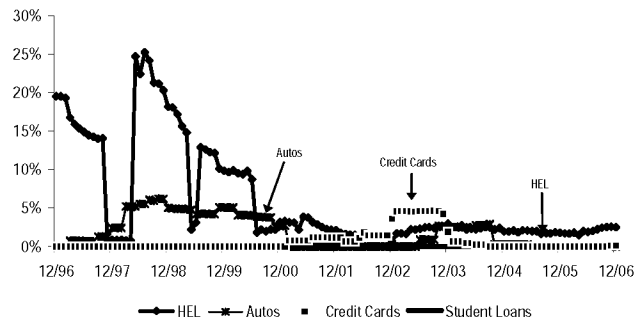
No transactions backed by auto loans or student loans experienced a downgrade and only one security backed by credit card receivables was downgraded during the year (Figure 14b). In recent years, the auto loan sector has been the most upgraded major ABS asset type by a substantial margin (Figure 14d).

## Figure 14 – 12-month Downgrade and Upgrade Rates for Select US ABS Asset Classes

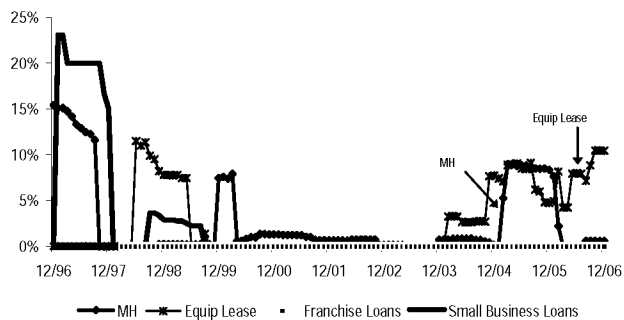
### Figure 14a – 12-month Downgrade Rates



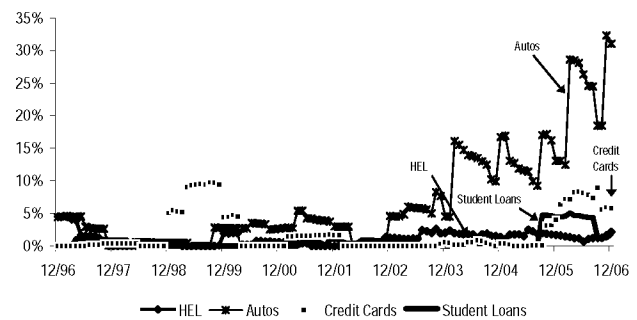
### Figure 14b – 12-month Downgrade Rates



### Figure 14c – 12-month Upgrade Rates



### Figure 14d – 12-month Upgrade Rates



Note: The horizontal axis represents the cohort ending date.

The downgrade rate for non-mortgage US ABS, i.e. excluding MH and HEL, dropped in 2006 to 1.7% relative to its level of 2.2% in 2005 (Figure 15). In addition, the upgrade rate rose to 7.1% from 4.0% leading to a strongly positive rating drift of 13.3% and a higher rating volatility of 23.4%.

| Figure 15 – Summary of 12-month Rating Transitions for non-mortgage US ABS |        |        |           |           |
|--|--------|--------|-----------|-----------|
|  | 2006   | 2005   | 1997-2006 | 1997-2005 |
| Downgrade Rate   | 1.70%  | 2.18%  | 4.54%     | 4.98%     |
| Upgrade Rate   | 7.12%  | 4.02%  | 2.40%     | 1.74%     |
| Downgrade/Upgrade ratio  | 0.24   | 0.54   | 1.89      | 2.84      |
| Downgrade Rate (notch weighted)  | 5.03%  | 5.42%  | 20.66%    | 23.19%    |
| Upgrade Rate (notch weighted)  | 18.35% | 11.36% | 6.41%     | 4.80%     |
| Downgrade/Upgrade ratio (notch weighted)                                   | 0.27   | 0.48   | 3.23      | 4.83      |
| Rating Drift (notch weighted)  | 13.32% | 5.94%  | -14.25%   | -18.39%   |
| Rating Volatility (notch weighted)   | 23.38% | 16.78% | 27.08%    | 28.00%    |
| Stability Rate   | 91.18% | 93.80% | 93.07%    | 93.28%    |
| Withdrawal Rate  | 11.83% | 17.16% | 12.99%    | 12.63%    |
| Notches per Downgrade per Year   | 2.96   | 2.49   | 4.31      | 4.56      |
| Notches per Upgrade per Year   | 2.58   | 2.83   | 3.05      | 3.14      |

Note: Non-mortgage US ABS includes all US ABS excluding MH and HEL.

## US ABS BACKED BY HOME EQUITY LOANS (HEL)

Out of a total universe of 11,022 US HEL ratings from 1688 deals outstanding at the beginning of 2006, 273 ratings from 155 deals were downgraded and 234 ratings from 84 deals were upgraded in 2006, resulting in a downgrade-to-upgrade ratio of 1.2, compared to 1.0 in 2005, and 2.4 historically.

Weaker than anticipated performance of the underlying pools was the recurring theme in most of the downgrades, but very often, other factors were also involved. These factors include weak performance triggers that allowed some transactions to “step down” and pay subordinated classes despite poor collateral performance and excess spread compression due to rising coupons on floating rate home equity tranches.<sup>10</sup> In some cases, weak triggers and/or the reduction in excess spread were sufficient to prompt the downgrade even though collateral performance to date was in line with the original expectations. The most oft-cited reason for HEL upgrades in 2006 was the high level of credit enhancement provided by subordination, overcollateralization, excess spread, and, in some cases, mortgage insurance relative to projected losses for the pool.

The home equity downgrades in 2006 were clustered in the 2001 to 2003 vintages, with securities issued in 2002 accounting for 40.7% of downgrades, those issued in 2001 and 2003 accounting for 18% a piece, and all three vintages combined totaling 76.6% of all downgrades. Upgrade activity was concentrated in the 2002 to 2004 vintages with the 2003 vintage taking the lion’s share of upgrades at 72.6%, the 2004 vintage the second largest share at 12.0%, and the 2002 vintage accounting for 10.3% of all upgrades.

For the US HEL sector in 2006 (see Figures 16 and 17)<sup>11</sup>:

- The downgrade rate increased to 2.5% in 2006 from 1.8% at the end of 2005, although the rate was still beneath the historical average of 3.3%. The upgrade rate also increased from 1.7% to 2.2% and was above its historical average of 1.4%.
- The magnitude of rating downgrades trended lower to 3.7 notches in 2006 compared to its year-prior level of 4.1 notches and the historical average of 4.4 notches. Nevertheless, downgrade severity remained higher for US HEL than those in other sectors. The magnitude of rating upgrades rose slightly to 2.5 notches from 2.4 notches a year ago.
- The rating drift, which has been below zero since 2003, stayed negative and decreased slightly to -3.8% from -3.3% in 2005 as the increase in the notch-weighted downgrade rate more than offset the increase in the upgrade rate. The increase in rating change activity caused rating volatility to increase to 14.6% from 11.5%.
- Much of the increase in rating change activity can be attributed to investment-grade HEL where the frequency of downgrades increased from 1.4% in 2005 to 2.1% in 2006 and the frequency of upgrades increased from 1.8% to 2.3%. In contrast, the downgrade rate for below investment-grade HEL was flat at approximately 7.5% and the upgrade rate fell from 1.1% in 2005 to 0.7% in 2006.

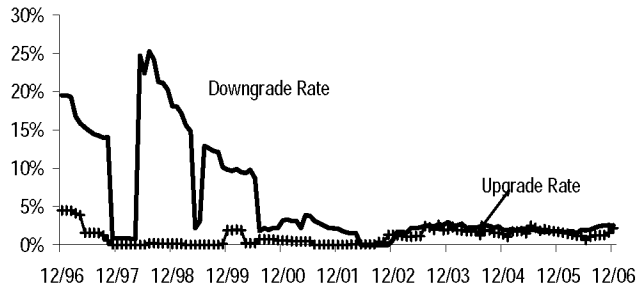
---

10. See “Rating Changes in the U.S. Asset-Backed Securities Market: 2006 Third Quarter Update,” *Moody’s Structured Finance Special Report*, November 2, 2006 and “Excess Spread Crunch in Certain Residential ABS 2002 to Mid-2004 Originations: A Case Study,” *Moody’s Structured Finance Special Report*, October 25, 2006.

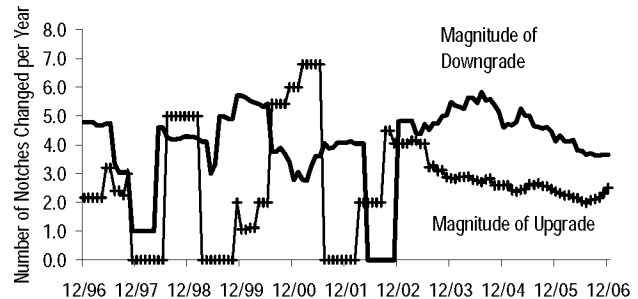
11. The historical rating transition trends for US HEL have changed from those presented in prior transition studies due to the reclassification of the DLJ/Quality mortgage deals to HEL from RMBS. The underlying mortgages in these deals were recently determined to be predominantly subprime. These deals performed very poorly and experienced both high downgrade and impairment rates. For more details, see “Deal Sponsor and Credit Risk of U.S. ABS and RMBS Securities,” *Moody’s Special Comment*, December 2006.

## Figure 16 – Rating Transition Trends for US HEL

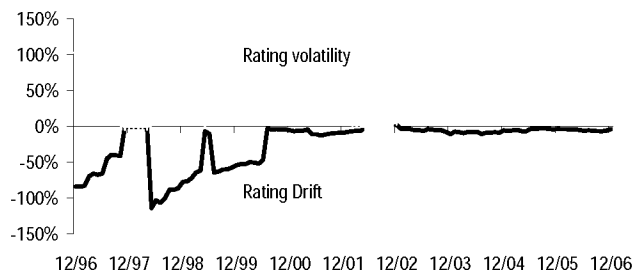
### Figure 16a – 12-month Downgrade Rates and Upgrade Rates



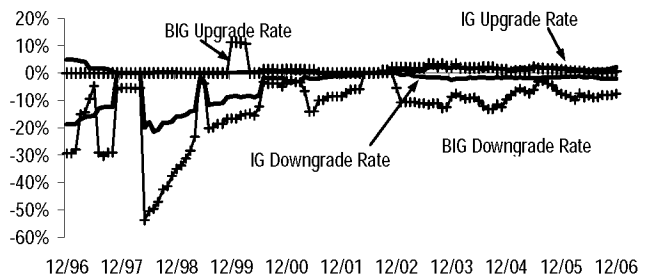
### Figure 16b – Magnitude of Downgrades and Upgrades



### Figure 16c – Rating Drift and Rating Volatility



### Figure 16d – Investment Grade (IG) and Below IG Downgrade and Upgrade Rates (downgrades marked negative)



Note: The horizontal axis represents the cohort ending date.

### Figure 17 – Summary of 12-month Rating Transitions for US HEL

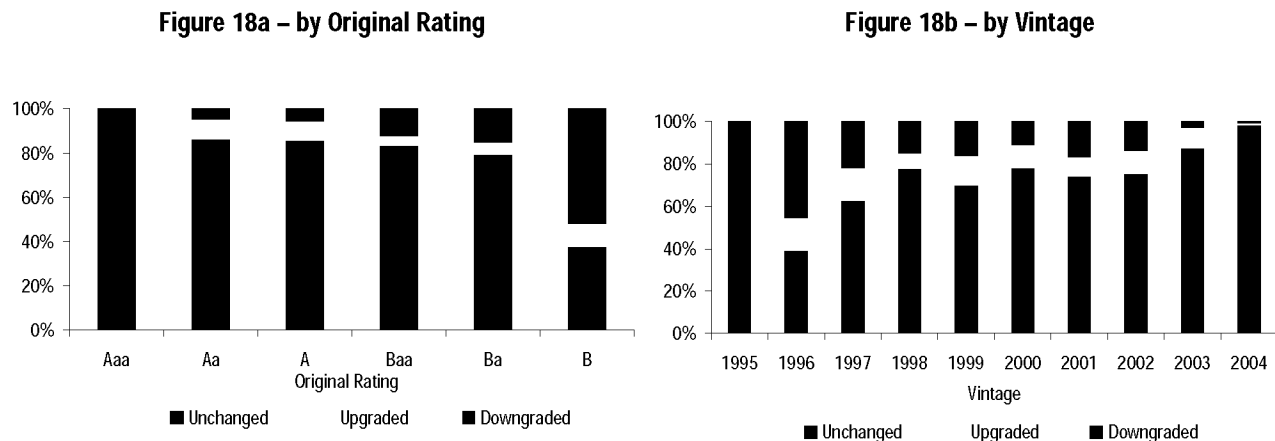
|  | 2006   | 2005   | 1997-2006 | 1997-2005 |
|--|--------|--------|-----------|-----------|
| Downgrade Rate                           | 2.52%  | 1.79%  | 2.86%     | 3.26%     |
| Upgrade Rate                             | 2.16%  | 1.71%  | 1.36%     | 1.36%     |
| Downgrade/Upgrade ratio                  | 1.17   | 1.05   | 2.12      | 2.41      |
| Downgrade Rate (notch weighted)          | 9.22%  | 7.41%  | 12.66%    | 15.20%    |
| Upgrade Rate (notch weighted)            | 5.41%  | 4.08%  | 3.56%     | 3.86%     |
| Downgrade/Upgrade ratio (notch weighted) | 1.70   | 1.82   | 3.58      | 3.97      |
| Rating Drift (notch weighted)            | -3.81% | -3.33% | -9.11%    | -11.34%   |
| Rating Volatility (notch weighted)       | 14.64% | 11.48% | 16.22%    | 19.06%    |
| Stability Rate                           | 95.32% | 96.49% | 95.79%    | 95.38%    |
| Withdrawal Rate                          | 3.29%  | 8.30%  | 6.32%     | 6.45%     |
| Notches per Downgrade per Year           | 3.66   | 4.13   | 4.20      | 4.40      |
| Notches per Upgrade per Year             | 2.51   | 2.38   | 2.56      | 2.76      |

High investment-grade US HEL securities have exhibited strong performance (Figure 18a). Aaa-rated US home equity securities are very stable with a cumulative downgrade rate of only 1.9% and tranches that were originally rated Aa and single-A have experienced more positive than negative credit migration. Performance has been somewhat weaker for securities rated Baa or below as downgrades have outnumbered upgrades, although ratings remain relatively stable for these categories except for single-B which has a small sample size.

The 1995 to 1997 vintages experienced very high cumulative downgrade rates due to the poor performance of the DLJ/Quality mortgage deals and increased competition among subprime originators during those years which led to loosened underwriting standards (Figure 18b).<sup>12</sup> The 2003 vintage has been the best-performing so far with a low

cumulative downgrade rate and a very high cumulative upgrade rate, particularly in light of the age of the transactions. Deals that closed in 2003 have benefited from the low interest rate environment and strong housing market over much of the life of the transactions.

**Figure 18 – Cumulative Rating Transition Rates for US HEL for pre-2005 vintages, 1989-2006**



12. See "1998 Year in Review and 1999 Outlook Home Equity Asset-Backed Securities: To HEL in a Handbasket," Moody's Structured Finance Special Report, January 8, 1999.

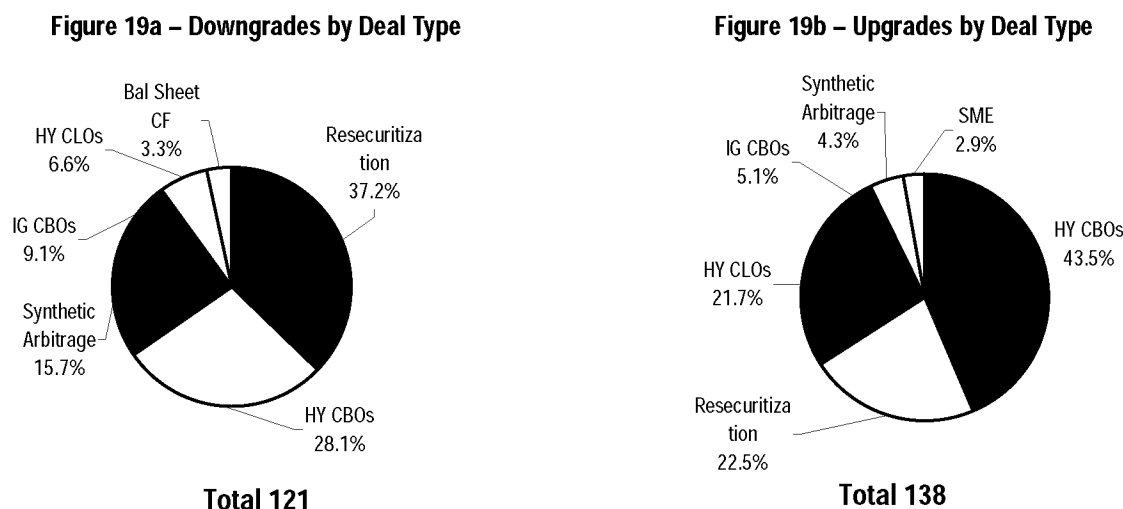


## US CDOS

Out of a total universe of 4,035 US CDO ratings from 1342 deals outstanding at the beginning of 2006, 121 ratings from 83 deals were downgraded and 138 ratings from 84 deals were upgraded in 2006. Resecuritization CDOs (37.2%), high-yield collateralized bond obligations (HY CBOs) (28.1%) and synthetic arbitrage CDOs (15.7%) together accounted for 81.0% of the downgrades in 2006 (Figure 19). All of the downgrades reflect deterioration in the credit quality of the transaction's underlying collateral portfolio and 59% of the securities had experienced prior downgrades.

HY CBOs were the leader in upgrades in 2006 with a 43.5% share of all US CDO upgrades. Resecuritization CDOs and high-yield collateralized bond obligations took second and third place for upgrade activity, respectively, with a 22% share each. Approximately 60% of the CDO upgrades cited delevering of the transaction and/or amortization of the notes as the major cause of the rating action, while around 40% pointed to improvement in the credit quality of the underlying deal portfolio, sometimes also accompanied with delevering of the transaction, as the primary motivation for the upgrade.

**Figure 19 - Distribution of US CDO Rating Changes in 2006**



For the US CDO sector in 2006 (see Figures 20 and 21):

- The downgrade rate was up slightly at 3.2% from its year-prior level of 3.0%, but still much lower than its historical average of 11.2% over the period 1997 to 2005. The upgrade rate continued its rising trend and reached a ten-year high of 3.6% in 2006.
- The average severity of rating downgrades fell to a five and a half-year low of 3.0 notches, down 1.5 notches from its level in 2005 and almost a full notch lower than its historical average prior to 2006. Conversely, the average severity of rating upgrades, which has been increasing since mid-2004, ended the year 2006 at 3.6 notches, up half a notch from its year-prior level and up almost 1.5 notches from the historical average.
- After crossing into positive territory in May 2006, a first since late 1998, the rating drift stayed above zero for the rest of the year due to the increasing frequency and size of upgrades. Rating volatility increased for the same reason from 18.7% in 2005 to 22.7% in 2006, but still remained much below the historical average of 47.3%.
- Much of the growth in rating change activity was due to below investment-grade securities, which have experienced both rising upgrade and downgrade rates. In contrast, the downgrade rate for investment-grade CDO securities has been mostly flat in 2006, while the upgrade rate increased, but more slowly than for speculative-grade CDOs.

## Figure 20 – Rating Transition Trends for US CDOs

Figure 20a – 12-month Downgrade Rates and Upgrade Rates

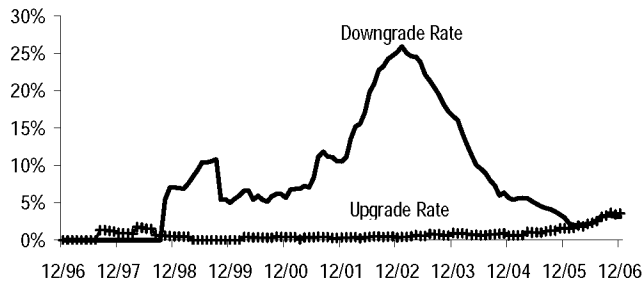


Figure 20b – Magnitude of Downgrades and Upgrades

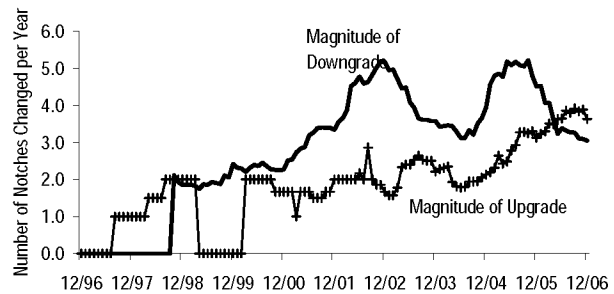


Figure 20c – Rating Drift and Rating Volatility

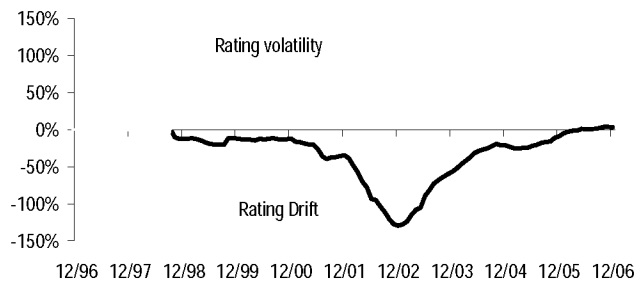
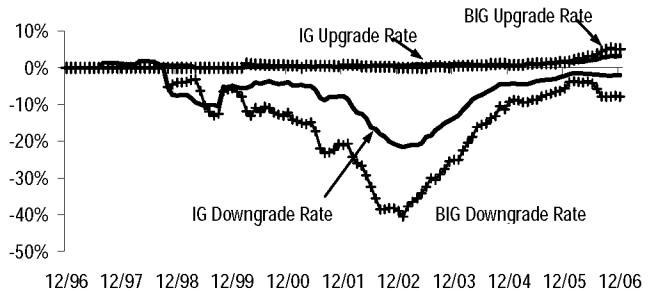


Figure 20d – Investment Grade (IG) and Below IG Downgrade and Upgrade Rates (downgrades marked negative)



Note: The horizontal axis represents the cohort ending date.

Figure 21 – Summary of 12-month Rating Transitions for US CDOs

|  | 2006   | 2005   | 1997-2006 | 1997-2005 |
|--|--------|--------|-----------|-----------|
| Downgrade Rate                           | 3.15%  | 3.04%  | 9.03%     | 11.23%    |
| Upgrade Rate                             | 3.59%  | 1.59%  | 1.23%     | 0.73%     |
| Downgrade/Upgrade ratio                  | 0.88   | 1.91   | 7.47      | 15.50     |
| Downgrade Rate (notch weighted)          | 9.61%  | 13.72% | 36.13%    | 45.50%    |
| Upgrade Rate (notch weighted)            | 13.05% | 4.97%  | 3.85%     | 1.77%     |
| Downgrade/Upgrade ratio (notch weighted) | 0.74   | 2.76   | 9.55      | 25.89     |
| Rating Drift (notch weighted)            | 3.44%  | -8.75% | -32.28%   | -43.73%   |
| Rating Volatility (notch weighted)       | 22.65% | 18.69% | 39.99%    | 47.27%    |
| Stability Rate                           | 93.26% | 95.37% | 89.74%    | 88.04%    |
| Withdrawal Rate                          | 9.64%  | 7.92%  | 6.18%     | 5.02%     |
| Notches per Downgrade per Year           | 3.05   | 4.51   | 3.80      | 3.91      |
| Notches per Upgrade per Year             | 3.63   | 3.13   | 2.56      | 2.17      |

While lifetime downgrades have outnumbered upgrades among US CDOs for all rating categories (Figure 22a), some of this can be attributed to the fact that Moody's typically does not upgrade a CDO tranche just prior to its being called or redeemed.<sup>13</sup> The cumulative downgrade rate was much higher for securities rated Baa or below relative to those rated Aaa, Aa, or single-A.

US CDO vintages from 1996 to 2001 experienced high lifetime downgrade rates due in part to high corporate default rates and low recovery rates during 2000 to 2002 (Figure 22b). However, performance has improved markedly since the 2002 vintage and upgrades have exceeded downgrades so far for the 2003 and 2004 vintages.

13. See "Credit Migration of CDO Notes, 1996-2005, for US and European Transactions," Moody's Structured Finance Special Report, March 17, 2006.

**Figure 22 – Cumulative Rating Transition Rates for US CDOs for pre-2005 vintages, 1990-2006**

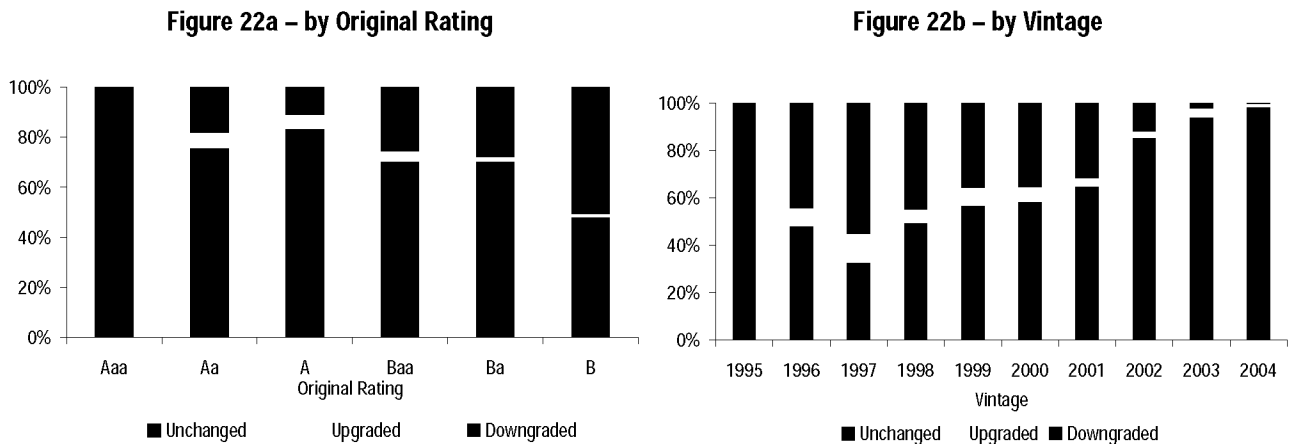
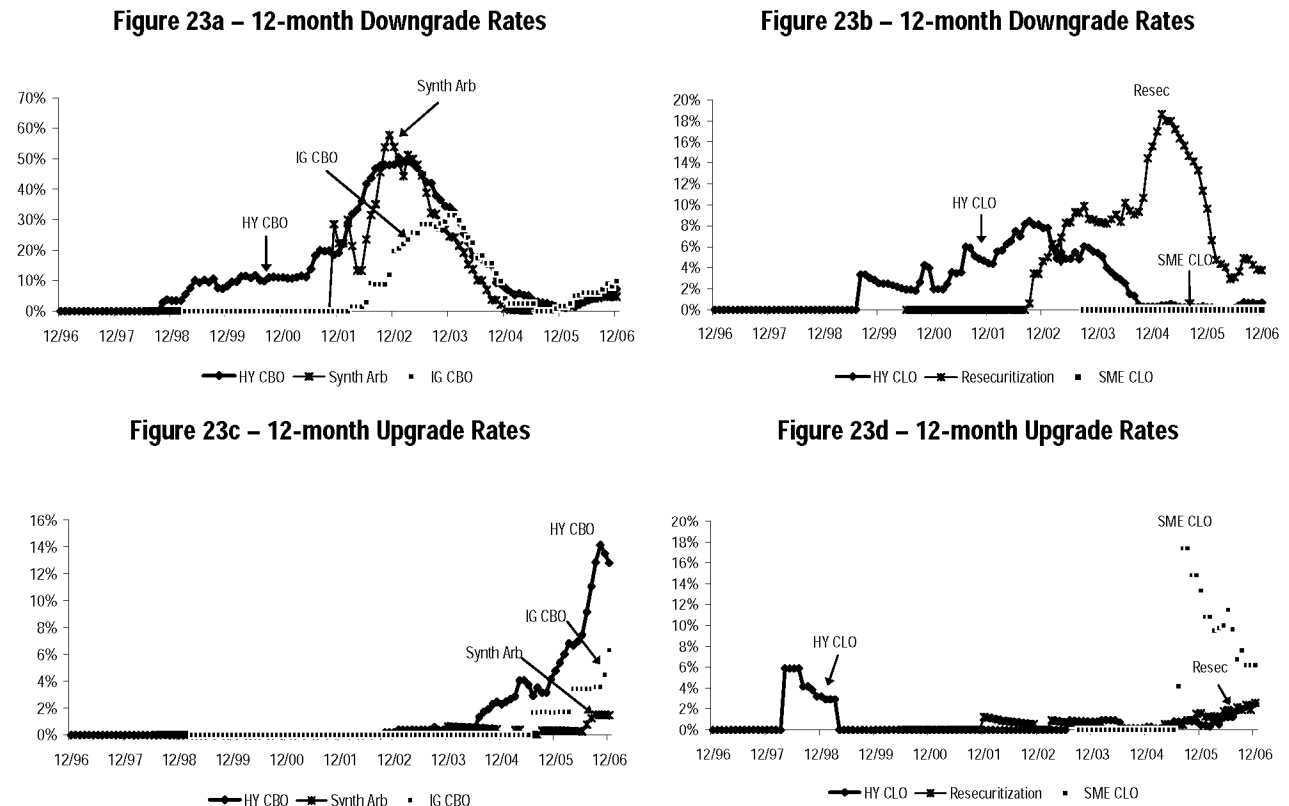


Figure 23 shows the 12-month downgrade and upgrade rates for a few CDO deal types. HY CBOs, IG CBOs, and synthetic arbitrage CDOs have all experienced much lower downgrade rates recently than they had during their peak levels in 2002 and 2003, although downgrade rates have increased since their lows in 2005 (Figure 23a). However, upgrade rates have also increased considerably in the last year, especially for HY CBOs (Figure 23c).

The frequency of downgrades for resecuritization CDOs has also decreased from a high in early 2005 and ended at 3.8% in 2006, while the frequency of upgrades was on an increasing trend (Figures 23b and 23d). HY CLOs continued to perform well with a very low downgrade rate and moderate upgrade rate. Although SME CLOs, collateralized loan obligations backed by small to medium size enterprises, are a relatively new and small deal type, they have enjoyed very good performance.<sup>14</sup>

**Figure 23 – 12-month Downgrade and Upgrade Rates for Select US CDO Deal Types**



Note: The horizontal axis represents the cohort ending date.

14. See "Update on the Market for U.S. SME CLOs," Moody's Structured Finance Special Report, August 25, 2006.

Unlike the past when HY CBOs were a drag on the performance of US CDOs<sup>15</sup>, HY CBOs were a net positive to the CDO sector in 2006. If HY CBOs are excluded from the calculation, then the frequency of both downgrades and upgrades declines, but the decrease in the upgrade rate is more severe leading to a downgrade-to-upgrade ratio that is greater than one and a negative rating drift (Figure 24).

|  | 2006   | 2005    | 1997-2006 | 1997-2005 |
|--|--------|---------|-----------|-----------|
| Downgrade Rate                           | 2.58%  | 3.42%   | 5.57%     | 6.87%     |
| Upgrade Rate                             | 2.31%  | 0.94%   | 0.90%     | 0.64%     |
| Downgrade/Upgrade ratio                  | 1.12   | 3.65    | 6.26      | 10.76     |
| Downgrade Rate (notch weighted)          | 8.30%  | 15.95%  | 22.66%    | 28.32%    |
| Upgrade Rate (notch weighted)            | 7.77%  | 2.48%   | 2.47%     | 1.47%     |
| Downgrade/Upgrade ratio (notch weighted) | 1.07   | 6.43    | 9.26      | 19.30     |
| Rating Drift (notch weighted)            | -0.53% | -13.47% | -20.18%   | -26.85%   |
| Rating Volatility (notch weighted)       | 16.07% | 18.44%  | 25.13%    | 29.79%    |
| Stability Rate                           | 95.11% | 95.65%  | 93.53%    | 92.49%    |
| Withdrawal Rate                          | 8.92%  | 8.35%   | 7.01%     | 5.94%     |
| Notches per Downgrade per Year           | 3.22   | 4.67    | 4.00      | 4.12      |
| Notches per Upgrade per Year             | 3.36   | 2.65    | 2.42      | 2.12      |

## US CMBS

In 2006, upgrades outnumbered downgrades in the US CMBS sector by more than 10 to 1. Out of a total universe of 4,434 US CMBS ratings from 515 deals outstanding at the beginning of 2006, 87 ratings from 40 deals were downgraded and 961 ratings from 242 deals were upgraded in 2006. Almost all the CMBS downgrades resulted from realized and anticipated losses from specially serviced loans and 61% of the securities had been downgraded previously. The vast majority of CMBS upgrades were caused by increased subordination levels and stable or improved pool performance. A high percentage of defeased loans was also cited as a contributing factor to many of the upgrades. The underlying cause of the strong performance of the CMBS pools was record levels of property price appreciation in recent years.

In addition, Moody's quantitative ("Q") tools such as Moody's Commercial Mortgage Metrics (CMM<sup>TM</sup>) and Moody's Surveillance Trend Scores (MOST<sup>TM</sup>) have enabled CMBS analysts to efficiently identify and act on CMBS transactions with significant changes to their credit profile. In August 2006, Moody's made 85 Q tool based upgrades and in December 2006, another 110 classes were upgraded using Q tools.<sup>16</sup>

For the US CMBS sector in 2006 (see Figures 25 and 26):

- The upgrade rate rose to a record-breaking high of 22.3% in 2006 at the same time that the downgrade rate fell to a four-year low of 2.0%, further widening the gap between the downgrade and upgrade rates.
- Both the magnitude of downgrades and upgrades ticked upwards, increasing from 1.8 notches in 2005 to 1.9 notches in 2006 for downgrades and rising from 2.3 to 2.6 for upgrades. The severity of downgrades has been much lower in US CMBS than in other sectors.
- Both rating drift and rating volatility continued their upward climb due to the increase in CMBS upgrades.
- The main driver of upgrade activity was investment-grade CMBS, where the upgrade rate reached an impressive all-time high of 30.5% in 2006. The upgrade rate for below investment-grade securities has also been increasing and more than doubled over the past year from 2.9% in 2005 to 5.9% in 2006. However, the upgrade rate for investment-grade securities is still more than five times larger than that of speculative-grade CMBS.
- The investment-grade downgrade rate has been below 1% since September 2005 and stood at an extremely low 0.2% in December 2006. Downgrade activity also slowed for below investment-grade securities, with a rate of 5.7% in 2006 versus 9.2% in 2005.

15. See "U.S. High-Yield CBOs: Analyzing the Performance of a Beleaguered CDO Category," Moody's Structured Finance Special Report, January 21, 2003 and "Structured Finance Rating Transitions: 1983-2005," Moody's Special Comment, February 2006

16. See "US CMBS: Q Tool Based Portfolio Review Results in Numerous Upgrades," Moody's Structured Finance Special Report, August 2, 2006 and Moody's press release, "Moody's Investors Service Upgrades 110 Classes of 44 Securitizations," December 8, 2006.

## Figure 25 – Rating Transition Trends for US CMBS

Figure 25a – 12-month Downgrade Rates and Upgrade Rates

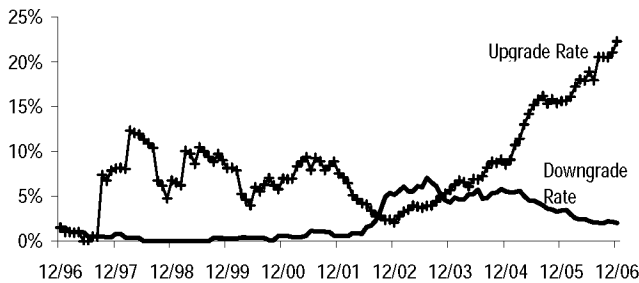


Figure 25b – Magnitude of Downgrades and Upgrades

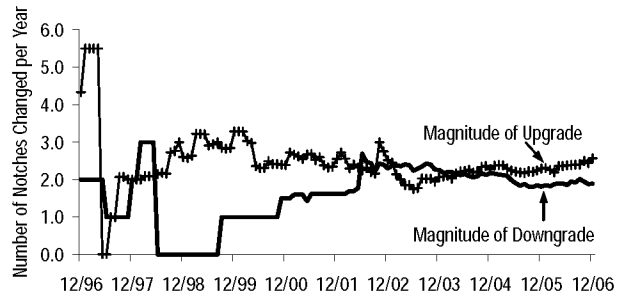


Figure 25c – Rating Drift and Rating Volatility

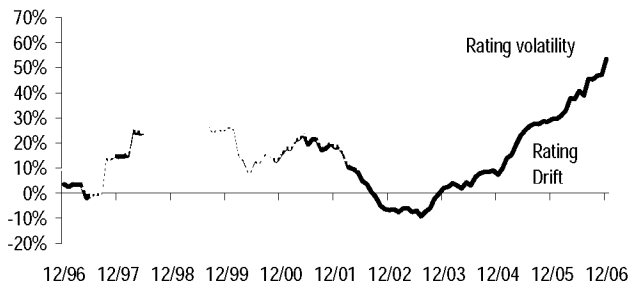
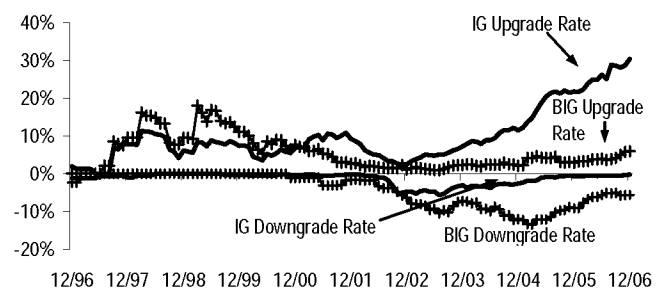


Figure 25d – Investment Grade (IG) and Below IG Downgrade and Upgrade Rates (downgrades marked negative)



Note: The horizontal axis represents the cohort ending date.

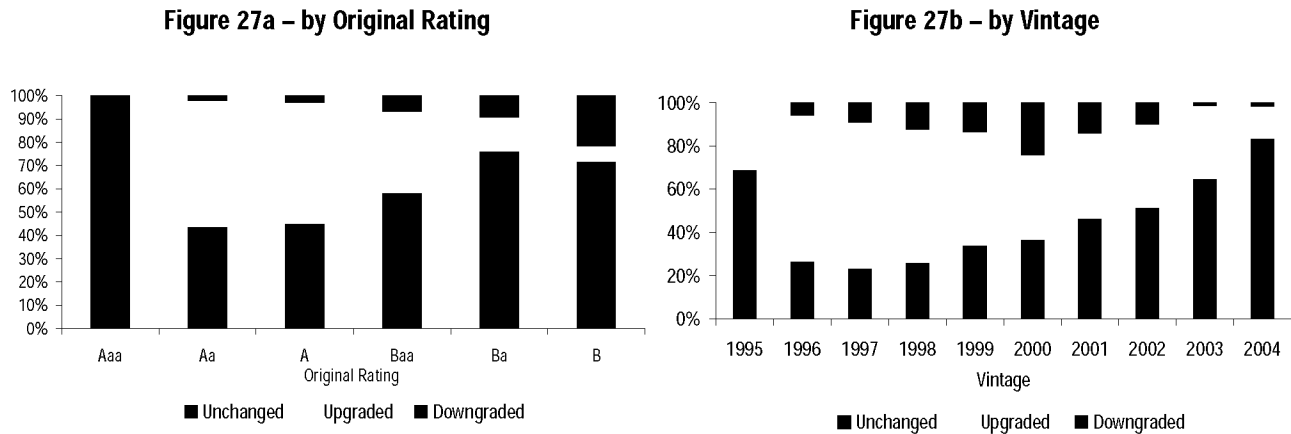
Figure 26 – Summary of 12-month Rating Transitions for US CMBS

|  | 2006   | 2005   | 1997-2006 | 1997-2005 |
|--|--------|--------|-----------|-----------|
| Downgrade Rate                           | 2.02%  | 3.42%  | 3.34%     | 3.63%     |
| Upgrade Rate                             | 22.30% | 15.66% | 10.65%    | 8.15%     |
| Downgrade/Upgrade ratio                  | 0.09   | 0.22   | 0.31      | 0.45      |
| Downgrade Rate (notch weighted)          | 3.81%  | 6.20%  | 7.00%     | 7.75%     |
| Upgrade Rate (notch weighted)            | 57.35% | 35.79% | 24.99%    | 18.83%    |
| Downgrade/Upgrade ratio (notch weighted) | 0.07   | 0.17   | 0.28      | 0.41      |
| Rating Drift (notch weighted)            | 53.55% | 29.59% | 17.99%    | 11.08%    |
| Rating Volatility (notch weighted)       | 61.16% | 42.00% | 31.99%    | 26.59%    |
| Stability Rate                           | 75.68% | 80.92% | 86.01%    | 88.23%    |
| Withdrawal Rate                          | 5.66%  | 7.32%  | 7.13%     | 7.04%     |
| Notches per Downgrade per Year           | 1.89   | 1.81   | 1.90      | 1.90      |
| Notches per Upgrade per Year             | 2.57   | 2.29   | 2.33      | 2.31      |

The divergence in performance between investment-grade and speculative-grade securities can also be seen in their cumulative rating transition rates (Figure 27a). Securities that were originally rated Aa, single-A, or Baa were much more likely to be upgraded than downgraded. While the cumulative upgrade rate is still higher than the downgrade rate for Ba-rated securities, the difference is smaller, and B-rated securities are much more likely to be downgraded than upgraded.

Across all vintages, lifetime upgrade rates were higher than downgrade rates (Figure 27b). However, while upgrade rates generally increased with seasoning, downgrade rates varied according to the timing of the commercial real estate credit cycle, with loans underwritten in 2000 experiencing the most difficult market environment to date.

**Figure 27 – Cumulative Rating Transition Rates for US CMBS pre-2005 vintages, 1987-2006**



## US RMBS

Unlike US HEL, the US RMBS sector continued to experience more positive than negative rating actions in 2006. Out of a total universe of 8,628 US RMBS ratings from 2,250 deals outstanding at the beginning of 2006, 36 ratings from 28 deals were downgraded and 329 ratings from 109 deals were upgraded in 2006. All the downgrades were caused by the weak performance of the underlying pools. In July 2006, Moody's upgraded 159 tranches from 60 jumbo prime RMBS deals citing the high prepayment rates and low or no losses experienced by the pools as the major reasons behind the upgrades.<sup>17</sup> Moreover, the virtually standard jumbo RMBS shifting-interest structure had resulted in significant increases in senior tranche credit enhancement levels. All other RMBS upgrades in 2006 were also caused by strong collateral performance, a build-up of credit enhancement, or both.

For the US RMBS sector in 2006 (see Figures 28 and 29)<sup>18</sup>:

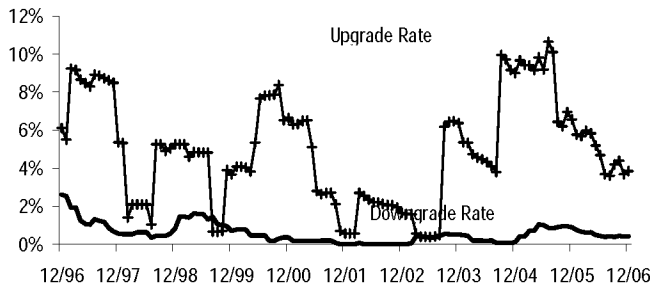
- The downgrade rate was 0.4%, less than half its already low level in 2005 of 0.9%. The upgrade rate also declined from 6.6% in 2005 to 3.8% in 2006.
- The average magnitude of rating downgrades fell from 4.8 notches in 2005 to 3.3 in 2006, a 1.5-notch decrease, while the magnitude of rating upgrades stayed steady at approximately 2.5 notches.
- The decrease in both the downgrade and upgrade rates caused rating volatility to decrease by almost half, to 10.8% in 2006 from 20.6% in 2005. The larger decrease in the notch-weighted upgrade rate relative to the downgrade rate caused the rating drift to fall to 8.0%, below both its year-prior level of 12.0% and its historical 10-year average of 11.6%.
- The rating transition rates for investment-grade and below investment-grade US RMBS followed the same general trend of US RMBS overall with both rating categories experiencing declining upgrade and downgrade activity.

17. See the related Moody's press release "Moody's upgrades 159 tranches of jumbo prime residential mortgage backed securities," July 17, 2006.

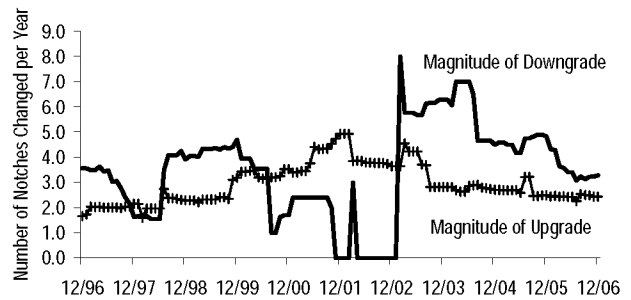
18. The historical rating transition trends for US RMBS have changed from those presented in prior transition studies due to the reclassification of the DLJ/Quality mortgage deals to HEL from RMBS. The underlying mortgages in these deals were recently determined to be predominantly subprime. These deals performed very poorly and experienced both high downgrade and impairment rates. For more details, see "Deal Sponsor and Credit Risk of U.S. ABS and RMBS Securities," Moody's Special Comment, December 2006.

## Figure 28 – Rating Transition Trends for US RMBS

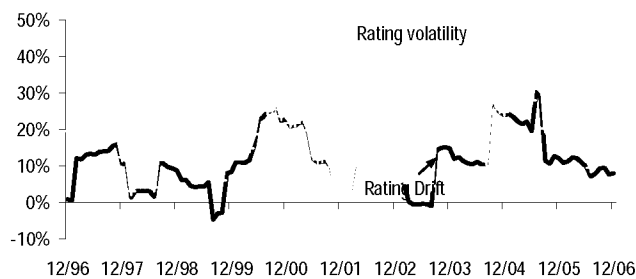
**Figure 28a – 12-month Downgrade Rates and Upgrade Rates**



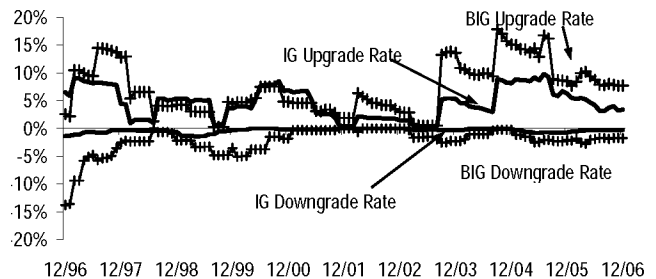
**Figure 28b – Magnitude of Downgrades and Upgrades**



**Figure 28c – Rating Drift and Rating Volatility**



**Figure 28d – Investment Grade (IG) and Below IG Downgrade and Upgrade Rates (downgrades marked negative)**



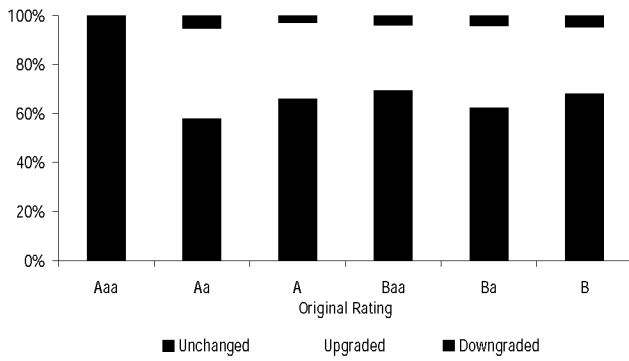
Note: The horizontal axis represents the cohort ending date.

| <b>Figure 29 – Summary of 12-month Rating Transitions for US RMBS</b> |        |        |           |           |
|---|--------|--------|-----------|-----------|
|   | 2006   | 2005   | 1997-2006 | 1997-2005 |
| Downgrade Rate  | 0.42%  | 0.89%  | 0.55%     | 0.57%     |
| Upgrade Rate  | 3.85%  | 6.56%  | 5.09%     | 5.20%     |
| Downgrade/Upgrade ratio   | 0.11   | 0.14   | 0.11      | 0.11      |
| Downgrade Rate (notch weighted)                                       | 1.38%  | 4.29%  | 2.22%     | 2.33%     |
| Upgrade Rate (notch weighted)   | 9.38%  | 16.34% | 13.80%    | 14.39%    |
| Downgrade/Upgrade ratio (notch weighted)                              | 0.15   | 0.26   | 0.16      | 0.16      |
| Rating Drift (notch weighted)   | 8.00%  | 12.05% | 11.59%    | 12.06%    |
| Rating Volatility (notch weighted)                                    | 10.76% | 20.63% | 16.02%    | 16.72%    |
| Stability Rate  | 95.73% | 92.55% | 94.36%    | 94.24%    |
| Withdrawal Rate   | 1.76%  | 7.69%  | 9.67%     | 10.99%    |
| Notches per Downgrade per Year  | 3.28   | 4.83   | 3.66      | 3.72      |
| Notches per Upgrade per Year  | 2.44   | 2.49   | 2.88      | 2.99      |

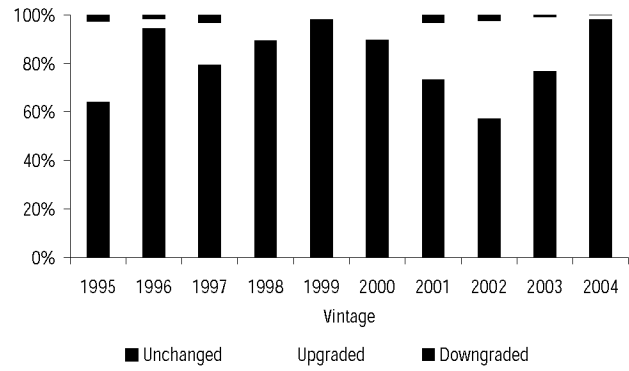
The stellar performance of US RMBS can be seen in Figure 30. Aaa-rated US RMBS experienced a cumulative downgrade rate of only 1.5% and all other rating categories experienced much higher incidences of upgrades than downgrades. The strong performance applied to all vintages, but the 2001 to 2003 vintages have experienced especially high levels of upgrade activity due to the strong US housing market during this time period.

**Figure 30 – Cumulative Rating Transition Rates for US RMBS pre-2005 vintages, 1984-2006**

**Figure 30a – by Original Rating**



**Figure 30b – by Vintage**





## Regional Comparisons of Rating Transitions

### EMEA AND US RATING TRANSITION RATES<sup>19</sup>

Out of a total universe of 4,631 EMEA structured finance ratings from 1,934 deals outstanding at the beginning of 2006, 68 ratings from 56 deals were downgraded and 163 ratings from 83 deals were upgraded in 2006. CDOs dominated the list of downgrades, accounting for 88.2% of all structured finance downgrades in 2006; CMBS accounted for a 10.3% share and ABS made up the remaining 1.5%. Almost all the CDO downgrades involved synthetic arbitrage deals which experienced negative portfolio credit migration, while all the CMBS downgrades were caused by under-performance of the underlying collateral.

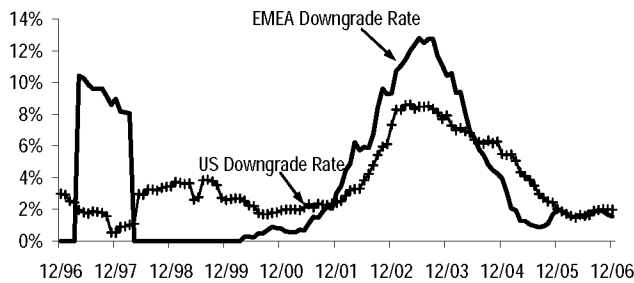
CDOs also took the largest share of upgrades in 2006, with a 43.6% share, followed by RMBS (30.1%), CMBS (16.6%) and ABS (9.8%). The reduced time to maturity, and thus lower credit exposure of the notes was a major factor in most CDO upgrades, while all RMBS and CMBS upgrades were caused by increased credit enhancement due to the pay-down of the notes, better than anticipated collateral performance, or both. In contrast, most ABS upgrades were prompted by the upgrade of a related third party.

The EMEA downgrade rate was in line with that of the US for most of 2006, but fell slightly towards the end of the year to 1.6%, below the US rate of 2.0% (Figures 31 and 32). The average magnitude of rating downgrades was flat for the year at 1.9 notches, the same level as in 2005, and 1.2 notches below the size of US downgrades in 2006.

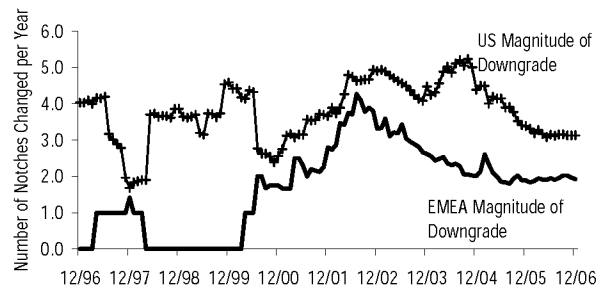
The EMEA upgrade rate was on a declining trend in 2006, ending at 3.7% in December, much lower than the US rate of 6.0%. The average magnitude of EMEA upgrades also remained under that of the US in 2006 at 2.1 notches, half a notch below the US average of 2.6 notches.

**Figure 31 – Comparison of Rating Transition Trends for EMEA and US Structured Finance**

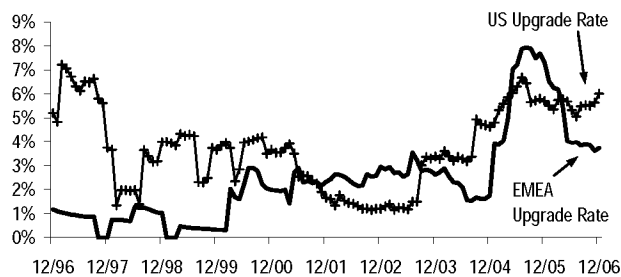
**Figure 31a – 12-month Downgrade Rates**



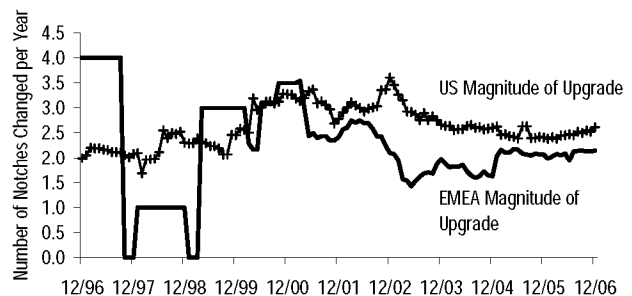
**Figure 31b – Magnitude of Downgrades**



**Figure 31c – 12-month Upgrade Rates**



**Figure 31d – Magnitude of Upgrades**



Note: The horizontal axis represents the cohort ending date.

19. A separate study for EMEA structured finance rating transitions is forthcoming.

**Figure 32 – Comparison of 12-month Rating Transitions for EMEA and US Structured Finance**

|  | EMEA   |        |           | US     |        |           |
|--|--------|--------|-----------|--------|--------|-----------|
|  | 2006   | 2005   | 1997-2005 | 2006   | 2005   | 1997-2005 |
| Downgrade Rate                           | 1.55%  | 1.99%  | 5.00%     | 1.98%  | 2.03%  | 4.46%     |
| Upgrade Rate                             | 3.73%  | 7.34%  | 3.60%     | 6.02%  | 5.71%  | 3.64%     |
| Downgrade/Upgrade ratio                  | 0.42   | 0.27   | 1.39      | 0.33   | 0.35   | 1.22      |
| Downgrade Rate (notch weighted)          | 2.99%  | 3.75%  | 13.74%    | 6.18%  | 6.87%  | 19.36%    |
| Upgrade Rate (notch weighted)            | 8.00%  | 15.20% | 7.47%     | 15.76% | 13.75% | 9.45%     |
| Downgrade/Upgrade ratio (notch weighted) | 0.37   | 0.25   | 1.85      | 0.39   | 0.50   | 2.04      |
| Rating Drift (notch weighted)            | 5.01%  | 11.45% | -6.28%    | 9.57%  | 6.88%  | -9.91%    |
| Rating Volatility (notch weighted)       | 10.99% | 18.96% | 21.21%    | 21.94% | 20.62% | 28.81%    |
| Stability Rate                           | 94.72% | 90.68% | 91.40%    | 92.01% | 92.26% | 91.90%    |
| Withdrawal Rate                          | 11.06% | 8.19%  | 7.03%     | 4.83%  | 9.00%  | 8.95%     |
| Notches per Downgrade per Year           | 1.93   | 1.89   | 2.31      | 3.13   | 3.39   | 4.05      |
| Notches per Upgrade per Year             | 2.15   | 2.07   | 2.06      | 2.62   | 2.41   | 2.69      |

Figure 33 compares the US and EMEA 12-month rating transition matrix for 2006. All but the single-B and Caa or below US structured finance rating categories experienced higher upgrade rates than their EMEA counterparts. However, all but the Aaa, Aa, and single-A US rating categories experienced higher downgrade rates. In addition, there were no EMEA downgrades into the Caa or below category in 2006.

**Figure 33 – Comparison of EMEA and US Structured Finance 12-month Rating Transition Matrices**

| EMEA in 2006  | Ratings to: |        |        |        |        |        |              |
|---------------|-------------|--------|--------|--------|--------|--------|--------------|
| Ratings from: | Aaa         | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa           | 99.32%      | 0.53%  | 0.15%  |        |        |        |              |
| Aa            | 2.20%       | 96.93% | 0.66%  | 0.22%  |        |        |              |
| A             | 0.30%       | 2.84%  | 95.54% | 1.32%  |        |        |              |
| Baa           | 0.25%       | 0.61%  | 2.82%  | 95.58% | 0.74%  |        |              |
| Ba            |             |        | 1.09%  | 3.64%  | 95.26% |        |              |
| B             |             |        |        |        | 7.27%  | 92.73% |              |
| Caa or below  |             |        |        |        |        | 4.82%  | 95.18%       |
| US in 2006    | Ratings to: |        |        |        |        |        |              |
| Ratings from: | Aaa         | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa           | 99.86%      | 0.11%  | 0.03%  |        |        |        |              |
| Aa            | 7.15%       | 92.35% | 0.43%  | 0.03%  | 0.02%  | 0.02%  |              |
| A             | 2.16%       | 5.48%  | 91.35% | 0.80%  | 0.13%  | 0.08%  |              |
| Baa           | 0.42%       | 0.87%  | 4.03%  | 92.05% | 1.51%  | 0.83%  | 0.29%        |
| Ba            | 0.28%       | 0.04%  | 0.56%  | 3.94%  | 92.21% | 1.93%  | 1.04%        |
| B             |             | 0.09%  | 0.18%  | 0.36%  | 3.29%  | 88.72% | 7.37%        |
| Caa or below  |             |        |        | 0.11%  | 0.11%  | 0.55%  | 99.23%       |

### ASIA-PACIFIC AND US RATING TRANSITION RATES<sup>20</sup>

Out of a total universe of 1,619 Asia-Pacific structured finance ratings from 920 deals outstanding at the beginning of 2006, 23 ratings from 19 deals were downgraded and 101 ratings from 67 deals were upgraded in 2006. All but one downgrade were associated with CDOs experiencing deterioration in the credit quality of their underlying portfolios. In contrast, all sectors of the Asia-Pacific market experienced upgrades, with CMBS accounting for the largest share (33.7%) followed by RMBS (26.7%), ABS (19.8%) and CDOs (19.8%).

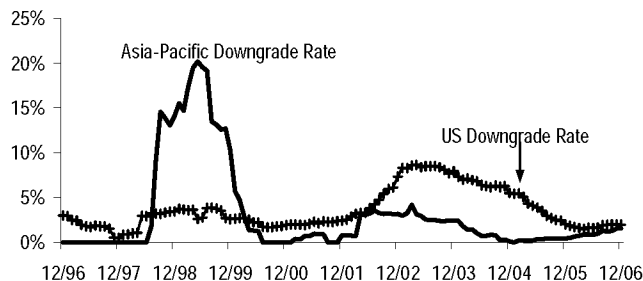
The most commonly cited reason for upgrades was increased credit enhancement due to pay-down of the notes, which was often accompanied by strong performance of the underlying pool. In addition, 17 of the 28 RMBS upgrades were due to a change in the mortgage insurer among Australian RMBS.

20. Two separate studies focusing on structured finance rating transitions in Japan and in the Asia-Pacific region ex Japan are forthcoming.

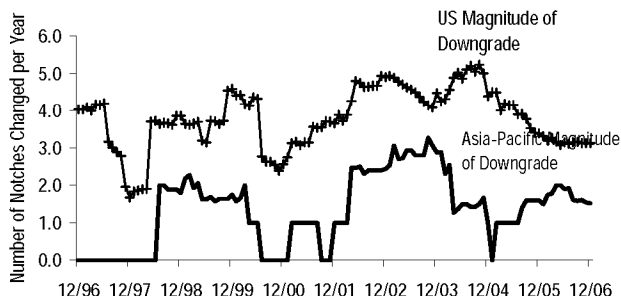
The Asia-Pacific structured finance downgrade rate increased to 1.5% in 2006 from its extremely low level of 0.4% in 2005 and was more in line with its historical average of 1.7% (Figures 34 and 35). At the same time, the upgrade rate decreased from 7.6% in 2005 to 6.8% in 2006. However, the frequency of Asia-Pacific downgrades remained below that of the US and the frequency of upgrades remained above the US upgrade rate. The average number of notches downgraded in the Asia-Pacific region fell slightly to 1.5 notches in 2006, 0.1 notches lower than its year-prior level and 1.6 notches lower than the US average. The average size of rating upgrades also declined from 3.3 notches in 2005 to 2.9 notches in 2006, but was still 0.3 notches higher than the average magnitude of US upgrades.

**Figure 34 – Comparison of Rating Transition Trends for Asia-Pacific and US Structured Finance**

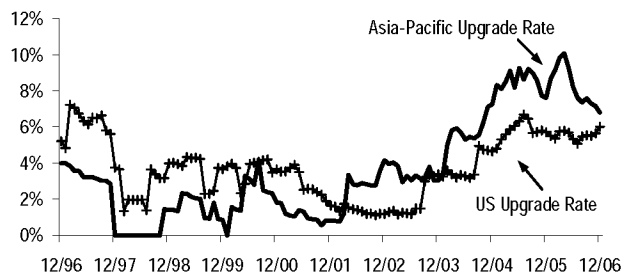
**Figure 34a – 12-month Downgrade Rates**



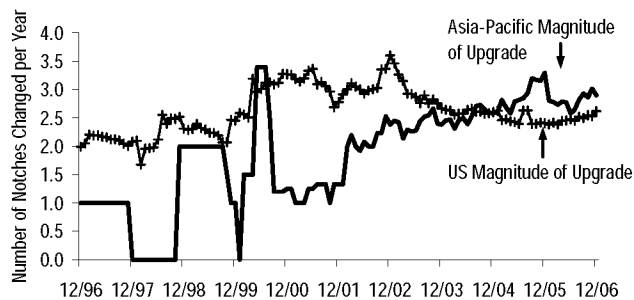
**Figure 34b – Magnitude of Downgrades**



**Figure 34c – 12-month Upgrade Rates**



**Figure 34d – Magnitude of Upgrades**



Note: The horizontal axis represents the cohort ending date.

**Figure 35 – Comparison of 12-month Rating Transitions for Asia-Pacific and US Structured Finance**

|  | Asia-Pacific |        |           | US     |        |           |
|--|--------------|--------|-----------|--------|--------|-----------|
|  | 2006         | 2005   | 1997-2005 | 2006   | 2005   | 1997-2005 |
| Downgrade Rate                           | 1.55%        | 0.43%  | 1.67%     | 1.98%  | 2.03%  | 4.46%     |
| Upgrade Rate                             | 6.81%        | 7.61%  | 5.08%     | 6.02%  | 5.71%  | 3.64%     |
| Downgrade/Upgrade ratio                  | 0.23         | 0.06   | 0.34      | 0.33   | 0.35   | 1.22      |
| Downgrade Rate (notch weighted)          | 2.36%        | 0.68%  | 3.61%     | 6.18%  | 6.87%  | 19.36%    |
| Upgrade Rate (notch weighted)            | 19.74%       | 25.06% | 13.48%    | 15.76% | 13.75% | 9.45%     |
| Downgrade/Upgrade ratio (notch weighted) | 0.12         | 0.03   | 0.28      | 0.39   | 0.50   | 2.04      |
| Rating Drift (notch weighted)            | 17.39%       | 24.38% | 9.87%     | 9.57%  | 6.88%  | -9.91%    |
| Rating Volatility (notch weighted)       | 22.10%       | 25.75% | 17.09%    | 21.94% | 20.62% | 28.81%    |
| Stability Rate                           | 91.64%       | 91.96% | 93.25%    | 92.01% | 92.26% | 91.90%    |
| Withdrawal Rate                          | 16.68%       | 21.12% | 14.36%    | 4.83%  | 9.00%  | 8.95%     |
| Notches per Downgrade per Year           | 1.52         | 1.60   | 1.62      | 3.13   | 3.39   | 4.05      |
| Notches per Upgrade per Year             | 2.90         | 3.29   | 2.38      | 2.62   | 2.41   | 2.69      |

Except for the Aa rating category, Asia-Pacific structured finance securities experienced higher upgrade rates in 2006 than US securities (Figure 36). Moreover, there were only two rating categories – Aa and single-A – in the Asia Pacific market that experienced any downgrades and none were to below investment-grade ratings.

**Figure 36 – Comparison of Asia-Pacific and US Structured Finance 12-month Rating Transition Matrices**

| Asia-Pacific in 2006 |             |        |        |        |        |        |              |
|----------------------|-------------|--------|--------|--------|--------|--------|--------------|
| Ratings from:        | Ratings to: |        |        |        |        |        |              |
|                      | Aaa         | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa                  | 100.00%     |        |        |        |        |        |              |
| Aa                   | 4.70%       | 93.91% | 1.38%  |        |        |        |              |
| A                    | 5.45%       | 5.00%  | 87.73% | 1.82%  |        |        |              |
| Baa                  | 2.70%       |        | 7.03%  | 90.27% |        |        |              |
| Ba                   | 2.94%       | 1.47%  | 1.47%  | 4.41%  | 89.71% |        |              |
| B                    |             |        | 9.30%  | 4.65%  |        | 86.05% |              |
| Caa or below         |             |        |        |        |        |        |              |
| US in 2006           |             |        |        |        |        |        |              |
| Ratings from:        | Aaa         | Aa     | A      | Baa    | Ba     | B      | Caa or below |
| Aaa                  | 99.86%      | 0.11%  | 0.03%  |        |        |        |              |
| Aa                   | 7.15%       | 92.35% | 0.43%  | 0.03%  | 0.02%  | 0.02%  |              |
| A                    | 2.16%       | 5.48%  | 91.35% | 0.80%  | 0.13%  | 0.08%  |              |
| Baa                  | 0.42%       | 0.87%  | 4.03%  | 92.05% | 1.51%  | 0.83%  | 0.29%        |
| Ba                   | 0.28%       | 0.04%  | 0.56%  | 3.94%  | 92.21% | 1.93%  | 1.04%        |
| B                    |             | 0.09%  | 0.18%  | 0.36%  | 3.29%  | 88.72% | 7.37%        |
| Caa or below         |             |        |        | 0.11%  | 0.11%  | 0.55%  | 99.23%       |

#### LATIN AMERICA AND US RATING TRANSITION RATES

Out of a total universe of 140 Latin American structured finance ratings from 124 deals outstanding at the beginning of 2006, 5 ratings from 5 deals were downgraded and 30 ratings from 28 deals were upgraded in 2006.

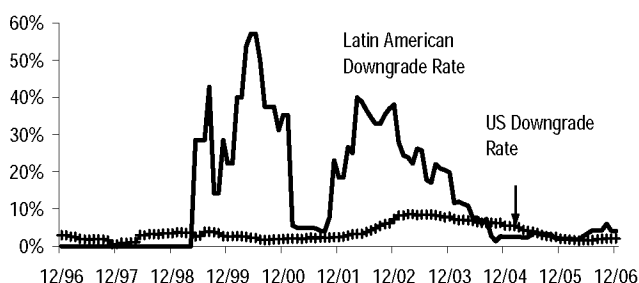
All downgrades affected Brazilian structured finance transactions. Three of the downgrades involved ABS deals that were affected by the downgrade of a third party, one involved an ABS deal that was negatively affected by the elimination of political risk enhancement to the transaction, and the remaining downgrade involved a transaction backed by a pool of residential mortgages with weaker-than-expected performance.

23 of the 30 upgrades affected Brazilian ABS that benefited from the upgrade of a third party and five upgrades concerned several transactions backed by personal loans issued out of Argentina and reflected the sound performance of the securitized pools.

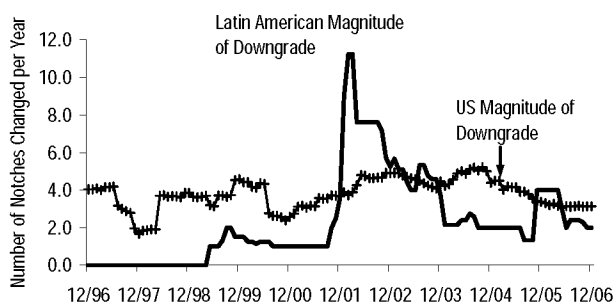
Because of the small size of the market, the downgrade and upgrade rates for Latin America can be somewhat volatile. Although only five downgrades were recorded for the year, the downgrade rate more than doubled from 1.9% in 2005 to 4.1% in 2006, but was still far below the historical average of 13.5% (Figures 37 and 38). Meanwhile, the upgrade rate climbed dramatically and reached an unprecedented high of 24.4%. The average size of rating downgrades dropped 50% from 4 to 2 notches over the year, while the average size of upgrades increased 0.6 notches to 1.9. The magnitudes of both Latin American downgrades and upgrades remained below that of US rating changes.

**Figure 37 – Comparison of Rating Transition Trends for Structured Finance in the US and Latin America**

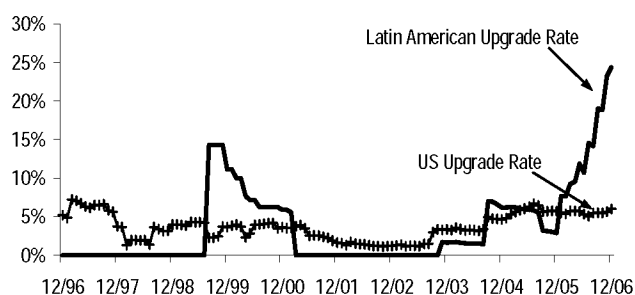
**Figure 37a – 12-month Downgrade Rates**



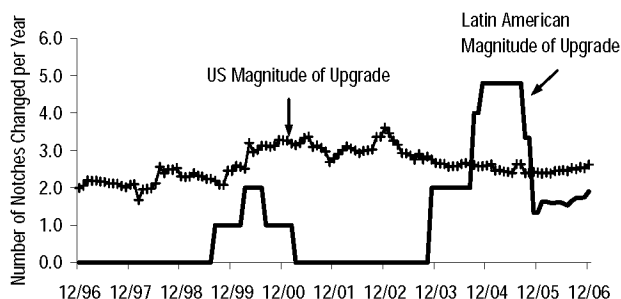
**Figure 37b – Magnitude of Downgrades**



**Figure 37c – 12-month Upgrade Rates**



**Figure 37d – Magnitude of Upgrades**



Note: The horizontal axis represents the cohort ending date.

**Figure 38 – Comparison of 12-month Rating Transitions for Structured Finance in the US and Latin America**

|  | Latin America |        |           | US     |        |           |
|--|---------------|--------|-----------|--------|--------|-----------|
|  | 2006          | 2005   | 1997-2005 | 2006   | 2005   | 1997-2005 |
| Downgrade Rate                           | 4.07%         | 1.91%  | 13.47%    | 1.98%  | 2.03%  | 4.46%     |
| Upgrade Rate                             | 24.39%        | 2.87%  | 2.90%     | 6.02%  | 5.71%  | 3.64%     |
| Downgrade/Upgrade ratio                  | 0.17          | 0.67   | 4.71      | 0.33   | 0.35   | 1.22      |
| Downgrade Rate (notch weighted)          | 8.13%         | 7.66%  | 58.38%    | 6.18%  | 6.87%  | 19.36%    |
| Upgrade Rate (notch weighted)            | 46.34%        | 3.83%  | 10.13%    | 15.76% | 13.75% | 9.45%     |
| Downgrade/Upgrade ratio (notch weighted) | 0.18          | 2.00   | 5.86      | 0.39   | 0.50   | 2.04      |
| Rating Drift (notch weighted)            | 38.21%        | -3.83% | -48.25%   | 9.57%  | 6.88%  | -9.91%    |
| Rating Volatility (notch weighted)       | 54.47%        | 11.48% | 68.52%    | 21.94% | 20.62% | 28.81%    |
| Stability Rate                           | 71.54%        | 95.22% | 83.63%    | 92.01% | 92.26% | 91.90%    |
| Withdrawal Rate                          | 24.29%        | 21.37% | 6.41%     | 4.83%  | 9.00%  | 8.95%     |
| Notches per Downgrade per Year           | 2.00          | 4.00   | 3.16      | 3.13   | 3.39   | 4.05      |
| Notches per Upgrade per Year             | 1.90          | 1.33   | 2.02      | 2.62   | 2.41   | 2.69      |

The vast majority of Latin American structured finance securities were rated Baa or below, so any entries in the high investment-grade categories should be interpreted with caution. For the Latin American structured finance market in 2006, only Baa-rated securities experienced any downgrades and securities carrying Baa, Ba, and single-B ratings experienced higher frequencies of upgrade than the same rating categories in the US market (Figure 39).

**Figure 39 – Comparison of 12-month Rating Transition Matrices for Latin America and US Structured Finance**

| Latin America in 2006 |         | Ratings to: |         |        |        |        |              |         |
|-----------------------|---------|-------------|---------|--------|--------|--------|--------------|---------|
| Ratings from:         | Aaa     | Aa          | A       | Baa    | Ba     | B      | Caa or below |         |
| Aaa                   | 100.00% |             |         |        |        |        |              |         |
| Aa                    |         |             |         |        |        |        |              |         |
| A                     |         |             | 100.00% |        |        |        |              |         |
| Baa                   | 1.23%   |             | 14.72%  | 81.60% | 1.23%  | 1.23%  |              |         |
| Ba                    |         |             |         | 27.59% | 72.41% |        |              |         |
| B                     |         |             |         |        | 7.14%  | 92.86% |              |         |
| Caa or below          |         |             |         |        |        |        |              | 100.00% |
| <b>US in 2006</b>     |         |             |         |        |        |        |              |         |
| Ratings from:         | Aaa     | Aa          | A       | Baa    | Ba     | B      | Caa or below |         |
| Aaa                   | 99.86%  | 0.11%       | 0.03%   |        |        |        |              |         |
| Aa                    | 7.15%   | 92.35%      | 0.43%   | 0.03%  | 0.02%  | 0.02%  |              |         |
| A                     | 2.16%   | 5.48%       | 91.35%  | 0.80%  | 0.13%  | 0.08%  |              |         |
| Baa                   | 0.42%   | 0.87%       | 4.03%   | 92.05% | 1.51%  | 0.83%  |              | 0.29%   |
| Ba                    | 0.28%   | 0.04%       | 0.56%   | 3.94%  | 92.21% | 1.93%  |              | 1.04%   |
| B                     |         | 0.09%       | 0.18%   | 0.36%  | 3.29%  | 88.72% |              | 7.37%   |
| Caa or below          |         |             |         | 0.11%  | 0.11%  | 0.55%  |              | 99.23%  |

## Rating Transitions in the Derivatives Sector

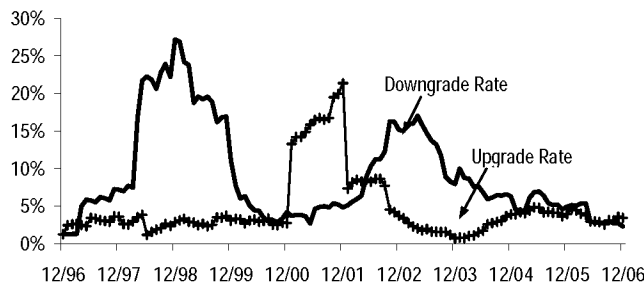
Out of a total universe of 1,839 global credit derivative ratings from 1,739 deals outstanding at the beginning of 2006, 40 ratings from 36 deals were downgraded and 60 ratings from 59 deals were upgraded in 2006. 37 of the 40 downgrades involved structured notes, while the remaining three involved repackaged securities. Structured notes and repackaged securities also made up the bulk of the upgrades in 2006, accounting for 53.3% and 30.0% of all upgrades respectively. Almost all the derivative rating changes were driven by changes in the rating of the underlying reference credit.

The downgrade rate in 2006 dropped to less than half its level the year prior and hit its lowest level (2.3%) since early 1997 (Figures 40 and 41). The upgrade rate declined moderately from 3.9% to 3.4%, falling further below the historical average. The average size of rating downgrades jumped to 2.6 notches in 2006 from 2 notches in 2005, while the average number of notches upgraded ended up flat relative to the previous year at 1.7 notches.

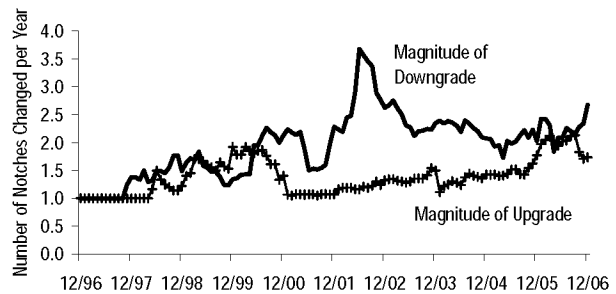
The downgrade rates for investment-grade and speculative-grade derivatives were roughly the same in 2005 at 4.9%, but went their separate ways in 2006. For investment-grade securities, the frequency of downgrades dropped to 1.4%, while for speculative-grade securities, the rate climbed to 13.7%.

**Figure 40 – Rating Transition Trends for Global Derivatives**

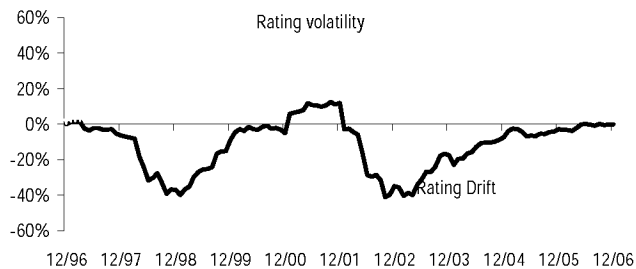
**Figure 40a – 12-month Downgrade Rates and Upgrade Rates**



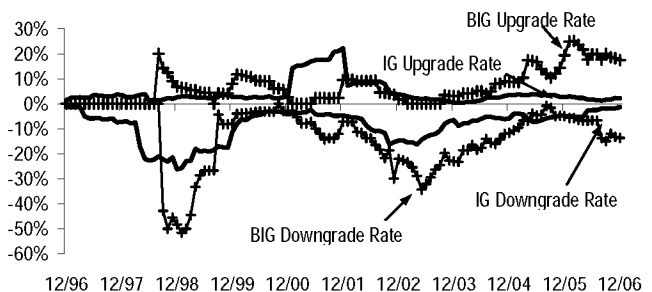
**Figure 40b – Magnitude of Downgrades and Upgrades**



**Figure 40c – Rating Drift and Rating Volatility**



**Figure 40d – Investment Grade (IG) and Below IG Downgrade and Upgrade Rates (downgrades marked negative)**



Note: The horizontal axis represents the cohort ending date.

|  | 2006   | 2005   | 1997-2006 | 1997-2005 |
|--|--------|--------|-----------|-----------|
| Downgrade Rate                           | 2.28%  | 4.90%  | 7.73%     | 8.83%     |
| Upgrade Rate                             | 3.42%  | 3.93%  | 4.47%     | 4.74%     |
| Downgrade/Upgrade ratio                  | 0.67   | 1.25   | 1.72      | 1.85      |
| Downgrade Rate (notch weighted)          | 6.11%  | 9.93%  | 16.90%    | 19.26%    |
| Upgrade Rate (notch weighted)            | 5.93%  | 6.96%  | 6.21%     | 6.06%     |
| Downgrade/Upgrade ratio (notch weighted) | 1.03   | 1.43   | 2.71      | 3.16      |
| Rating Drift (notch weighted)            | -0.17% | -2.97% | -10.69%   | -13.20%   |
| Rating Volatility (notch weighted)       | 12.04% | 16.89% | 23.11%    | 25.32%    |
| Stability Rate                           | 94.29% | 91.17% | 87.80%    | 86.43%    |
| Withdrawal Rate                          | 9.41%  | 8.52%  | 9.01%     | 9.22%     |
| Notches per Downgrade per Year           | 2.68   | 2.03   | 2.18      | 2.16      |
| Notches per Upgrade per Year             | 1.73   | 1.77   | 1.49      | 1.37      |

Because ratings in the derivatives sector are heavily linked to global corporate and sovereign ratings, it is more appropriate to compare derivative rating transitions with corporate rating transitions. In 2006, derivative ratings were more stable than their corporate counterparts except for Ba-rated securities (Figure 42). The higher rating volatility rate among derivatives for the Ba-rating category was due to rating changes for some corporate issuers such as Ford, whose senior unsecured rating was downgraded from Ba1 in the beginning of 2006 to Caa1 by the end of 2006.

| Derivatives in 2006 |        | Ratings to: |        |        |        |        |              |  |
|---------------------|--------|-------------|--------|--------|--------|--------|--------------|--|
| Ratings from:       | Aaa    | Aa          | A      | Baa    | Ba     | B      | Caa or below |  |
| Aaa                 | 99.79% | 0.21%       |        |        |        |        |              |  |
| Aa                  | 1.20%  | 98.12%      | 0.51%  | 0.17%  |        |        |              |  |
| A                   |        |             |        |        |        |        |              |  |
| Baa                 | 0.42%  | 0.42%       | 1.70%  | 95.33% | 0.85%  | 1.27%  |              |  |
| Ba                  |        |             | 3.70%  | 6.17%  | 77.78% | 6.17%  | 6.17%        |  |
| B                   |        |             |        |        | 11.43% | 88.57% |              |  |
| Caa or below        |        |             |        |        |        | 6.45%  | 93.55%       |  |
| Corporate in 2006   |        | Ratings to: |        |        |        |        |              |  |
| Ratings from:       | Aaa    | Aa          | A      | Baa    | Ba     | B      | Caa or below |  |
| Aaa                 | 97.95% | 1.54%       | 0.51%  |        |        |        |              |  |
| Aa                  | 1.35%  | 97.63%      | 1.01%  |        |        |        |              |  |
| A                   | 0.47%  | 3.08%       | 93.16% | 3.15%  | 0.13%  |        |              |  |
| Baa                 | 0.08%  | 0.17%       | 6.09%  | 89.85% | 2.71%  | 0.93%  | 0.17%        |  |
| Ba                  |        | 0.17%       | 0.17%  | 8.99%  | 80.81% | 8.82%  | 1.04%        |  |
| B                   |        |             | 0.24%  | 0.12%  | 10.55% | 80.47% | 8.63%        |  |
| Caa or below        |        |             |        |        |        | 22.86% | 77.14%       |  |



## Appendix I: Description of Data Sample and Glossary

---

### DESCRIPTION OF DATA SAMPLE

The data sample for the study covers all structured finance rating observations globally between 1983 and 2006 and uses the following set of criteria:

- Only securities carrying Moody's long-term bond ratings are included, whereas short-term ratings, foreign national ratings, provisional ratings, and rating estimates are excluded.
- Tranches wrapped by financial guarantors, government agencies, or government sponsored enterprises (GSEs) are excluded.
- Interest-only (IO) tranches and residual tranches are excluded.
- Deals whose credit quality are entirely dependent on a single corporate rating, such as single borrower credit tenant lease (CTL) deals in CMBS, are excluded. Derivative ratings, which are generally linked to the credit rating of a single entity, are also excluded from the overall structured finance statistics and are analyzed separately in the report.
- Tranches carrying the same rating from the same deal are collapsed into a single rating observation, with the following exception: if two or more tranches share the same rating in the same deal, but are collateralized by distinct groups of loan pools, then the tranches are not collapsed.

The corporate data set used to compare corporate rating transitions to structured finance rating transitions includes international corporate and sovereign issuers, but excludes US municipal ratings.

The structured finance data set used in this study is available through Moody's Structured Finance Default Risk Service (DRS) database and the corporate data set is available through Moody's Corporate Default Risk Service (DRS) database.

### GLOSSARY

#### ***Broad Ratings and Refined Ratings***

Broad ratings refer to the following Moody's long-term bond rating categories: Aaa, Aa, A, Baa, Ba, B, and Caa or below. Refined ratings or ratings with numeric modifiers refer to Aaa, Aa1, Aa2, Aa3, A1, A2, A3, Baa1, Baa2, Baa3, Ba1, Ba2, Ba3, B1, B2, B3, Caa1, Caa2, Caa3, Ca, and C. The broad rating category Caa or below includes the following refined ratings: Caa1, Caa2, Caa3, Ca, and C.

#### ***Investment-Grade and Below Investment-Grade (or Speculative-Grade) Ratings***

Investment-grade ratings refer to Aaa, Aa1, Aa2, Aa3, A1, A2, A3, Baa1, Baa2, and Baa3. Below investment-grade or speculative-grade ratings refer to Ba1, Ba2, Ba3, B1, B2, B3, Caa1, Caa2, Caa3, Ca, and C.

#### ***Downgrade (Upgrade) Rate***

A security is considered to have been downgraded (upgraded) if its rating at the end of a pre-specified time period is lower (higher) than at the beginning of the time period on the basis of ratings with numeric modifiers (also known as refined ratings or modified ratings). The downgrade rate is the number of securities downgraded (or upgraded) divided by the total number of outstanding securities at the beginning of the time period, after excluding *half* of the ratings withdrawn during that time period. Note that in measuring downgrade rates and upgrade rates, only ratings at the beginning and the end of the time period are considered.

#### ***Average Number of Total Notches Downgraded (Upgraded) per Year***

The number of total notches downgraded (upgraded) per year for a downgraded (upgraded) security is the difference in the rating of that security at the beginning and end of a 12-month period based on refined ratings. This term is also referred to as the magnitude, size, or severity of the rating change. The average number of total notches downgraded (upgraded) per year averages this quantity for all downgraded (upgraded) securities over the 12-month period. A security can experience multiple rating actions during a 12-month period, and therefore, this measure is different from the average number of notches changed per rating *action*. For example, if a security is downgraded from Baa1 to Baa2 and then Baa2 to Baa3 over 12 months, then the average number of notches changed *per rating action* would be one, but the average number of total notches changed *per year* would be two.

### ***Weighted Downgrade (Upgrade) Rate***

The weighted downgrade (upgrade) rate is computed as the number of securities downgraded (upgraded), weighted by the number of total notches changed per downgrade (upgrade) per year, divided by the total number of outstanding securities at the beginning of the 12-month period, after excluding *half* of the ratings withdrawn during that period. For example, a security downgraded from Baa1 to B1 over 12 months is counted as three downgrades in the calculation of a weighted downgrade rate, but counted as only one downgrade in the calculation of the unweighted downgrade rate.

### ***Downgrade (Upgrade) Rate by Broad Rating***

In calculating a downgrade (upgrade) rate by broad rating, a downgrade (upgrade) occurs only if the initial and end rating are in two different broad rating categories. For example, a rating change from Baa1 to Ba2 is considered a downgrade by broad rating, but a rating change from Baa1 to Baa3 is not. The latter case would still be considered to be a downgrade by refined rating, and therefore refined downgrade (upgrade) rates are always greater than or equal to broad downgrade (upgrade) rates.

### ***Cumulative (or Lifetime) Downgrade (Upgrade) Rate***

A security is considered to have experienced a cumulative or lifetime downgrade (upgrade), if its rating before withdrawal or rating at the end of the study period is lower (higher) than its original rating. The cumulative downgrade (upgrade) rate for a particular group of securities is computed as the number of securities to experience a cumulative downgrade (upgrade) divided by the total number of securities in the group.

### ***Rating Stability Rate***

The rating stability rate is a measure of the proportion of ratings that were unchanged over a pre-specified time period. It is calculated as one minus the sum of the downgrade rate and upgrade rate.

### ***Withdrawal Rate***

The withdrawal rate is computed as the total number of ratings withdrawn by the end of a pre-specified time period divided by the total number of ratings outstanding at the beginning of that time period.

### ***Rating Drift***

The rating drift is defined as the weighted upgrade rate minus the weighted downgrade rate.

### ***Rating Volatility***

The rating volatility is defined as the weighted upgrade rate plus the weighted downgrade rate.

### ***Downgrade-to-Upgrade Ratio (weighted, lifetime)***

The downgrade-to-upgrade ratio is calculated as the total number of downgraded ratings divided by the total number of upgraded ratings. The weighted downgrade-to-upgrade ratio, or downgrade-to-upgrade ratio weighted by the number of notches changed, computes the ratio of weighted downgrades to weighted upgrades. The lifetime downgrade-to-upgrade ratio is calculated as the number of ratings that have experienced a lifetime downgrade divided by the number of ratings that have experienced a lifetime upgrade.

### ***ABS***

ABS stand for asset-backed securities. This structured finance sector includes securities backed by home equity loans (HEL) and both traditional asset types such as auto loans, credit card receivables, student loans, and manufactured housing loans, and non-traditional asset types such as mutual fund fees, tax liens, tobacco settlement payments, and intellectual property.

### ***Non-mortgage ABS***

Non-mortgage ABS are asset-backed securities excluding both HEL and securities backed by manufactured housing (MH) loans.

## ***HEL***

The home equity loan or HEL sector include securities back by subprime (B&C) mortgage loans, home improvement loans, high loan-to-value (high LTV) loans, home equity lines of credit (HELOCs), and closed-end second-lien loans, as well as net interest margin (NIM) securitizations. It does not include securities backed by Alt-A mortgages, which are included in the RMBS sector. HEL is part of the ABS sector.

## ***CDOs***

CDOs stand for collateralized debt obligations. Derivative securities such as structured notes and repackaged securities are not considered to be part of this sector. Commercial real estate (CRE) CDOs, where 70% or more of the collateral is composed of CRE loans, are classified as CMBS. If the collateral backing the transaction contains less than 70% CRE loans, then the deal is classified as a CDO.

## ***CMBS***

CMBS stand for commercial mortgage-backed securities. Commercial real estate (CRE) CDOs, where 70% or more of the collateral is composed of CRE loans, are classified as CMBS. If the collateral backing the transaction contains less than 70% CRE loans, then the deal is classified as a CDO.

## ***RMBS***

RMBS stand for residential mortgage-backed securities. The large majority of these securities are backed by first-lien prime mortgages, but some are backed by Alt-A mortgages. In some older vintage RMBS transactions, subprime mortgages may also be included in the collateral. HEL is not considered to be part of this sector.

## ***Derivatives***

The derivatives sector contains structured notes, repackaged securities, and credit derivatives, as well as structured covered bonds, catastrophe-linked notes, and structured investment vehicles. This sector was denoted as “Others” in Moody’s first transition study in 2003.

## ***Global structured finance***

Global structured finance captures global structured securities in four major sectors: ABS, CDO, CMBS, and RMBS. The derivatives sector is excluded from this term to better summarize the rating transition experiences of core structured finance securities by removing the influence of securities that are wholly dependent on corporate credits.

## ***U.S. Structured Finance Securities***

U.S. structured finance securities are denominated in U.S. dollars and issued in the U.S. market or denominated in Canadian dollars and issued in Canada. In cases where the source of the underlying collateral and the denomination of the securities crossed multiple countries/regions, deals are classified by the location at which they are monitored.

## ***EMEA Structured Finance Securities***

EMEA is an abbreviation for Europe, the Middle East, and Africa. EMEA structured finance securities are denominated in a currency from or issued out of a country in the EMEA region. In cases where the source of the underlying collateral and the denomination of the securities crossed multiple countries/regions, deals are classified by the location at which they are monitored.

## ***Asia-Pacific Structured Finance Securities***

Asia-Pacific structured finance securities are denominated in the currency of a country in the Asia-Pacific region or issued in an Asia-Pacific country (including Japan and Australia). In cases where the source of the underlying collateral and the denomination of the securities crossed multiple countries/regions, deals are classified by the location at which they are monitored.

## ***Latin American Structured Finance Securities***

Latin American structured finance securities are denominated in a Latin American currency or issued in Latin America. In cases where the source of the underlying collateral and the denomination of the securities crossed multiple countries/regions, deals are classified by the location at which they are monitored.

## Appendix II: Methodology

---

### COMPUTATION OF RATING TRANSITION STATISTICS

Rating transition statistics can be reported by cohort rating or by original rating. For statistics calculated by cohort rating, *every month the rating migration of all outstanding securities are tracked over a pre-specified time period regardless of when the security was issued.* For statistics calculated by original rating, every month the rating migration of all securities issued in that month are tracked over a pre-specified time period, in which case each security carries its original rating at the start of the period.

Unless otherwise stated, transition statistics in the report are calculated by cohort rating and usually the pre-specified time period is one year, although multi-year statistics are also reported. In any case, the rating (including WR) must exist over the entire time period in order to be counted, e.g. a rating must be seasoned at least three years to be counted in a three-year downgrade rate, and only the rating outstanding at the beginning and end of the time period are used.

All average transition statistics (downgrade rates, upgrade rates, transition matrices, etc.) are calculated by averaging over the rates calculated on a monthly basis, where each month's contribution to the total is weighted by the number of ratings used in that month's computation. For example, the average 12-month downgrade rate over 1997 to 2006 is calculated by taking a weighted average of the 120 12-month downgrade rates calculated for each month in that 10-year period.

There are basically three reasons for differences in transition rates reported by original rating and cohort rating:

- First, grouping by original rating implies that all tranches are newly issued and have zero seasoning whereas grouping by cohort rating means that all tranches have different ages, with some being newly issued and some being highly seasoned. Because the likelihood of a rating change is different at different points in the life of the security<sup>21</sup>, the distribution of the ages of the securities in the group will influence the rating transition rate.
- Second, some of the securities that are grouped by cohort rating may have been downgraded or upgraded to that rating rather than having been issued with the rating. To the extent that there is rating change momentum, the tranche may be more or less likely to be downgraded or upgraded compared to a similarly-rated tranche that has not experienced a rating change.<sup>22</sup>
- Third, securities and rating changes are weighted differently in the original rating and cohort rating calculations. For transition rates by original rating, each security is counted exactly once and contributes to either the total number of downgrades, upgrades, or stable ratings. In contrast, for transition rates by cohort rating, a tranche appears in many cohorts, one for every month that the rating is outstanding, which gives older securities more weight than newer securities. In addition, a tranche can contribute multiple times to the count of stable ratings during periods when its rating is constant, and can also contribute multiple times to the count of downgraded or upgraded ratings if it is downgraded or upgraded.

### ADJUSTING FOR WITHDRAWN RATINGS (WR)

The rating downgrade and upgrade rates reported in this study have been adjusted for withdrawn ratings by deducting *half* of the ratings withdrawn during the time period under consideration from the total number of outstanding ratings at the beginning of the time period.<sup>23</sup>

In the Appendix to follow, transition matrices of all time horizons (unless otherwise noted) are displayed with a final column labeled **WR** that contains the proportion of ratings in the category that were withdrawn by the end of the time period. This presents a complete account of rating transitions. Below is an example of how to adjust these transition matrices for withdrawals, i.e. how to remove the **WR** column.

The following table lists a sample row in a transition matrix with the **WR** column for the Aa rating category.

---

21. The effect of seasoning on downgrade and upgrade rates for structured finance securities was initially discussed in Moody's first global structured finance transition study, "Structured Finance Rating Transitions: 1983-2002," Moody's Special Comment, January 2003.

22. Rating change momentum was also documented in Moody's first global structured finance transition study.

23. In the structured finance transition studies published in 2003 and 2004, all withdrawn ratings were deducted from the population. However, the current method was adopted for the 2005 study and is used for all subsequent transition and default studies.

| Sample Row from a Transition Matrix unadjusted for WR |       |        |       |       |       |       |              |       |
|---|-------|--------|-------|-------|-------|-------|--------------|-------|
|   | Aaa   | Aa     | A     | Baa   | Ba    | B     | Caa or below | WR    |
| Aa  | 5.62% | 84.36% | 1.90% | 0.62% | 0.16% | 0.09% | 0.12%        | 7.13% |

To adjust the transitions rates for downgrades and upgrades, take the original rate and divide by one minus half the rate in the WR column. For example, for transitions from Aa to Aaa, the adjusted rate is  $5.62\% / (1 - 7.13\%/2) = 5.82\%$ . The single-A, Baa, Ba, B, and Caa or below categories should be similarly adjusted. The adjusted transition rates for the aforementioned categories are displayed in the table below.

| Sample Row from a Transition Matrix adjusted for WR |       |        |       |       |       |       |              |       |
|---|-------|--------|-------|-------|-------|-------|--------------|-------|
|   | Aaa   | Aa     | A     | Baa   | Ba    | B     | Caa or below | WR    |
| Aa  | 5.82% | 91.18% | 1.97% | 0.64% | 0.16% | 0.10% | 0.13%        | 7.13% |

The adjusted stability rate, which appears in the diagonal entries in the matrix, uses a different calculation and is computed as one minus the adjusted rates of all the other categories. In this example, the Aa column is calculated as  $1 - (5.82\% + 1.97\% + 0.64\% + 0.16\% + 0.10\% + 0.13\%) = 91.18\%$ .

To summarize, first calculate the adjusted non-diagonal entries of the matrix by taking the original rate and dividing by one minus half the withdrawal rate, and then compute the adjusted diagonal entries by subtracting the sum of the other adjusted entries in the same row from one.

The rating transition experience of securities that were withdrawn five years after origination is shown in the “matrices by original rating” section of Appendix III.

## COUNTING DOWNGRADES AND UPGRADES

A security is considered to have been downgraded (upgraded) if its rating at the end of a pre-specified time period is lower (higher) than at the beginning of the time period. There are several reasons why that the count of downgrades and upgrades reported in this study may differ from those in other Moody's reports even when the same universe of securities is under consideration.

First, tranches carrying the same rating from the same deal, i.e. *pari passu* tranches, are collapsed into a single rating observation in this study, which may not be the practice in other reports.

Second, only the rating at the beginning and end of the time period are considered in counting rating changes. In particular, if a security is downgraded (upgraded) multiple times over the period under consideration, this will still be counted as one downgrade (upgrade). Moreover, if a tranche is downgraded and then upgraded (or upgraded and then downgraded) so that its start rating and end rating are the same, then no rating change will be considered as having occurred and neither the downgrade nor the upgrade will be counted. This is fairly uncommon as rating reversals are unusual, particularly over short time periods.

Third, if a security was rated after the cohort formation date and experienced a rating change over the time period under consideration, then the change will not be counted. For example, in counting downgrades for the year 2006, if a tranche was initially rated and then downgraded in 2006, then the downgrade would not be counted because the tranche was not part of the cohort that was formed in the beginning of the year as it did not exist then. This is also unusual because ratings are very stable in the first year of seasoning.

Fourth, if a security experienced a rating transition and the rating was subsequently withdrawn before the end of the year, then the rating change will not be counted. For example, in counting upgrades for the year 2006, if a tranche is upgraded in March and the rating is withdrawn in September then the rating at the end of the year is WR and the tranche will be considered to have transitioned into WR, not the upgraded rating. This has a more significant effect on upgrades than downgrades because often, securities that are upgraded are paid down soon after and have their ratings withdrawn.

To put this issue into perspective, if we had counted tranches that experienced a rating change in 2006, but whose rating was withdrawn by the end of the year, then the number of global structured finance downgrades would increase from 709 to 732, a 3.2% increase, and the number of upgrades would increase from 2161 to 2259, a 4.5% increase. The 12-month downgrade rate for 2006 would increase from 1.92% to 1.98% and the upgrade rate would increase from 5.84% to 6.10%. Therefore, while the exact statistics reported would be different, the general trends would not.

The number of rating transitions that are not counted due to withdrawals increases with the length of the time horizon under consideration because the longer the time period, the higher the withdrawal rate. While we believe that the withdrawal rate itself is an interesting statistic, many are interested in knowing about intermediate rating changes prior to the final transition into WR.

One way this information can be provided is through lifetime rating transition rates, which count downgrades and upgrades based on the rating before withdrawal. Figures with this data are included in the main body of the report for global structured finance and the major US asset types.

Another way this information can be supplied is through an examination of the original ratings and ratings before withdrawal of the securities with WR ratings. This will indicate what percentage of the withdrawn securities experienced migrations to other rating categories in their lifetime. This data is provided in the bottom-most transition matrix for the 5-year transition matrices by original rating in Appendix III.

Below is an excerpt from the transition matrix for withdrawn securities for the 5-yr cohort by original rating for global structured finance. The universe of securities under consideration in this row are those that were originally rated Aa, seasoned at least 5 years, and had WR ratings 5 years after issuance. For these tranches, 73.8% were still rated Aa immediately before withdrawal, 17.6% had been upgraded to Aaa, 3.7% had been downgraded to single-A, 1.6% had been downgraded to Baa, etc.

| <b>Sample Row from a Transition Matrix of Ratings prior to WR</b> |            |           |          |            |           |          |                     |
|---|------------|-----------|----------|------------|-----------|----------|---------------------|
|   | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa or below</b> |
| <b>Aa</b>   | 17.62%     | 73.82%    | 3.72%    | 1.61%      | 0.74%     | 0.62%    | 1.86%               |

However, note that while this transition matrix provides some information about rating history prior to withdrawal, it does not indicate the reason for the withdrawal, whether the security was impaired during its lifetime, or whether it was paid off. This will be the topic of future research.

## Appendix III: Multi-Year Horizon Transition Matrices<sup>24</sup>

### MATRICES BY COHORT RATING

**Figure 43 - Global Structured Finance Rating Transition Matrices by Cohort Rating (1984-2006)**

| 1-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
|---------------|--------|--------|--------|--------|--------|--------|--------------|--------|
| Aaa           | 87.66% | 0.66%  | 0.19%  | 0.06%  | 0.03%  | 0.01%  | 0.03%        | 11.36% |
| Aa            | 5.53%  | 84.51% | 1.72%  | 0.54%  | 0.13%  | 0.07%  | 0.13%        | 7.36%  |
| A             | 1.23%  | 3.46%  | 84.95% | 1.71%  | 0.50%  | 0.20%  | 0.23%        | 7.72%  |
| Baa           | 0.34%  | 0.55%  | 2.94%  | 85.53% | 2.30%  | 0.97%  | 0.97%        | 6.40%  |
| Ba            | 0.10%  | 0.09%  | 0.54%  | 3.08%  | 83.36% | 3.14%  | 3.99%        | 5.70%  |
| B             | 0.05%  | 0.03%  | 0.11%  | 0.39%  | 2.16%  | 82.39% | 9.52%        | 5.34%  |
| Caa or below  | 0.02%  | 0.00%  | 0.00%  | 0.04%  | 0.08%  | 0.36%  | 89.60%       | 9.90%  |
| <b>2-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 74.21% | 1.09%  | 0.40%  | 0.18%  | 0.10%  | 0.05%  | 0.09%        | 23.87% |
| Aa            | 10.07% | 68.28% | 2.89%  | 1.27%  | 0.43%  | 0.27%  | 0.43%        | 16.36% |
| A             | 2.70%  | 5.59%  | 69.01% | 2.57%  | 1.02%  | 0.48%  | 0.85%        | 17.78% |
| Baa           | 0.83%  | 1.27%  | 5.08%  | 69.31% | 3.58%  | 1.93%  | 3.02%        | 14.98% |
| Ba            | 0.19%  | 0.26%  | 1.45%  | 4.87%  | 67.02% | 4.45%  | 8.95%        | 12.81% |
| B             | 0.08%  | 0.04%  | 0.21%  | 0.77%  | 3.52%  | 67.67% | 15.91%       | 11.79% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.07%  | 0.20%  | 0.61%  | 80.05%       | 19.07% |
| <b>3-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 61.17% | 1.27%  | 0.57%  | 0.31%  | 0.17%  | 0.11%  | 0.17%        | 36.23% |
| Aa            | 13.30% | 53.99% | 3.53%  | 1.84%  | 0.79%  | 0.53%  | 0.84%        | 25.20% |
| A             | 3.74%  | 6.39%  | 54.49% | 2.91%  | 1.27%  | 0.72%  | 1.64%        | 28.84% |
| Baa           | 1.25%  | 1.73%  | 6.03%  | 54.48% | 4.23%  | 2.65%  | 5.72%        | 23.90% |
| Ba            | 0.35%  | 0.45%  | 2.13%  | 5.64%  | 53.08% | 4.78%  | 13.36%       | 20.21% |
| B             | 0.11%  | 0.04%  | 0.25%  | 1.16%  | 3.45%  | 55.15% | 20.84%       | 19.00% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.08%  | 0.28%  | 0.73%  | 70.65%       | 28.26% |
| <b>4-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 50.67% | 1.23%  | 0.60%  | 0.37%  | 0.21%  | 0.15%  | 0.25%        | 46.52% |
| Aa            | 15.68% | 42.56% | 3.74%  | 2.07%  | 0.91%  | 0.77%  | 1.23%        | 33.05% |
| A             | 4.43%  | 6.32%  | 43.25% | 2.57%  | 1.28%  | 0.74%  | 2.16%        | 39.24% |
| Baa           | 1.72%  | 1.99%  | 6.36%  | 43.79% | 4.37%  | 2.79%  | 8.01%        | 30.97% |
| Ba            | 0.46%  | 0.58%  | 2.41%  | 6.16%  | 42.27% | 4.56%  | 16.42%       | 27.14% |
| B             | 0.15%  | 0.00%  | 0.25%  | 1.51%  | 2.50%  | 46.08% | 23.21%       | 26.30% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.04%  | 0.39%  | 0.65%  | 62.84%       | 36.08% |
| <b>5-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 42.16% | 1.05%  | 0.55%  | 0.38%  | 0.18%  | 0.15%  | 0.24%        | 55.28% |
| Aa            | 17.64% | 33.69% | 3.41%  | 1.93%  | 0.79%  | 0.84%  | 1.44%        | 40.26% |
| A             | 5.17%  | 6.12%  | 33.84% | 1.92%  | 0.99%  | 0.65%  | 2.28%        | 49.04% |
| Baa           | 2.25%  | 2.33%  | 6.78%  | 36.12% | 3.65%  | 2.61%  | 9.67%        | 36.59% |
| Ba            | 0.59%  | 0.85%  | 2.84%  | 6.89%  | 33.55% | 3.78%  | 16.68%       | 34.83% |
| B             | 0.26%  | 0.00%  | 0.22%  | 2.05%  | 1.84%  | 38.66% | 23.17%       | 33.80% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.51%  | 0.84%  | 55.19%       | 43.46% |

24. All the transition matrices presented in this section are unadjusted for withdrawn ratings. See Appendix II for instructions on how to adjust these matrices for withdrawals.

**Figure 44 - US ABS Rating Transition Matrices by Cohort Rating (1984-2006)**

| 1-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
|---------------|--------|--------|--------|--------|--------|--------|--------------|--------|
| Aaa           | 85.48% | 0.75%  | 0.29%  | 0.11%  | 0.07%  | 0.04%  | 0.09%        | 13.17% |
| Aa            | 2.40%  | 87.47% | 1.95%  | 0.82%  | 0.25%  | 0.16%  | 0.39%        | 6.55%  |
| A             | 0.62%  | 1.62%  | 86.55% | 1.73%  | 0.62%  | 0.30%  | 0.37%        | 8.20%  |
| Baa           | 0.21%  | 0.22%  | 1.07%  | 87.85% | 2.76%  | 1.31%  | 1.50%        | 5.08%  |
| Ba            | 0.14%  | 0.11%  | 0.21%  | 1.84%  | 77.51% | 4.94%  | 9.97%        | 5.28%  |
| B             | 0.00%  | 0.00%  | 0.13%  | 0.37%  | 0.28%  | 69.27% | 25.30%       | 4.65%  |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.02%  | 0.03%  | 0.14%  | 87.93%       | 11.88% |
| <b>2-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 69.86% | 1.25%  | 0.58%  | 0.31%  | 0.23%  | 0.13%  | 0.25%        | 27.40% |
| Aa            | 4.50%  | 72.21% | 3.51%  | 1.95%  | 0.79%  | 0.63%  | 1.33%        | 15.07% |
| A             | 1.28%  | 2.53%  | 70.98% | 2.75%  | 1.12%  | 0.67%  | 1.31%        | 19.36% |
| Baa           | 0.49%  | 0.52%  | 1.74%  | 72.65% | 4.81%  | 2.63%  | 4.75%        | 12.41% |
| Ba            | 0.31%  | 0.33%  | 0.46%  | 1.40%  | 56.18% | 5.87%  | 22.52%       | 12.94% |
| B             | 0.15%  | 0.00%  | 0.33%  | 0.64%  | 0.52%  | 50.20% | 35.95%       | 12.22% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.03%  | 0.02%  | 0.21%  | 76.17%       | 23.57% |
| <b>3-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 54.60% | 1.39%  | 0.77%  | 0.54%  | 0.37%  | 0.26%  | 0.45%        | 41.62% |
| Aa            | 6.03%  | 57.72% | 4.56%  | 2.91%  | 1.23%  | 1.37%  | 2.58%        | 23.61% |
| A             | 1.58%  | 2.61%  | 55.87% | 3.16%  | 1.40%  | 0.89%  | 2.46%        | 32.02% |
| Baa           | 0.64%  | 0.68%  | 2.05%  | 55.98% | 6.16%  | 3.74%  | 9.32%        | 21.43% |
| Ba            | 0.56%  | 0.56%  | 0.53%  | 1.43%  | 40.43% | 4.81%  | 31.78%       | 19.90% |
| B             | 0.41%  | 0.00%  | 0.64%  | 1.01%  | 0.89%  | 35.31% | 39.32%       | 22.43% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.05%  | 0.00%  | 0.26%  | 63.21%       | 36.48% |
| <b>4-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 42.06% | 1.33%  | 0.77%  | 0.62%  | 0.41%  | 0.31%  | 0.67%        | 53.84% |
| Aa            | 6.28%  | 46.24% | 5.24%  | 3.32%  | 1.18%  | 2.05%  | 3.64%        | 32.05% |
| A             | 1.68%  | 2.04%  | 44.38% | 2.74%  | 1.43%  | 0.83%  | 2.95%        | 43.95% |
| Baa           | 0.69%  | 0.76%  | 1.97%  | 43.82% | 6.92%  | 3.98%  | 13.13%       | 28.73% |
| Ba            | 0.78%  | 0.73%  | 0.66%  | 1.30%  | 28.87% | 4.36%  | 37.68%       | 25.63% |
| B             | 1.04%  | 0.00%  | 0.82%  | 1.44%  | 1.25%  | 27.14% | 33.95%       | 34.35% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.08%  | 51.75%       | 48.17% |
| <b>5-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 31.50% | 1.25%  | 0.79%  | 0.63%  | 0.35%  | 0.29%  | 0.62%        | 64.57% |
| Aa            | 6.52%  | 37.84% | 5.24%  | 3.40%  | 1.02%  | 2.51%  | 3.91%        | 39.56% |
| A             | 1.94%  | 1.66%  | 34.66% | 2.05%  | 0.97%  | 0.71%  | 3.01%        | 55.00% |
| Baa           | 0.82%  | 0.94%  | 1.92%  | 35.98% | 6.06%  | 3.60%  | 16.80%       | 33.86% |
| Ba            | 0.96%  | 0.80%  | 0.82%  | 1.16%  | 22.46% | 3.83%  | 37.04%       | 32.94% |
| B             | 1.71%  | 0.00%  | 0.71%  | 1.95%  | 1.21%  | 21.55% | 27.32%       | 45.55% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 43.67%       | 56.33% |



**Figure 45 - US HEL Rating Transition Matrices by Cohort Rating (1989-2006)**

| <b>1-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa or below</b> | <b>WR</b> |
|---------------|------------|-----------|----------|------------|-----------|----------|---------------------|-----------|
| Aaa           | 88.43%     | 0.37%     | 0.13%    | 0.04%      | 0.01%     | 0.00%    | 0.00%               | 11.02%    |
| Aa            | 2.08%      | 90.91%    | 1.11%    | 0.28%      | 0.03%     | 0.02%    | 0.00%               | 5.56%     |
| A             | 0.28%      | 1.67%     | 92.06%   | 1.43%      | 0.33%     | 0.08%    | 0.16%               | 3.99%     |
| Baa           | 0.03%      | 0.12%     | 0.63%    | 91.24%     | 1.93%     | 0.99%    | 0.90%               | 4.15%     |
| Ba            | 0.00%      | 0.12%     | 0.24%    | 1.07%      | 86.17%    | 2.62%    | 5.42%               | 4.35%     |
| B             | 0.00%      | 0.00%     | 0.28%    | 0.56%      | 0.60%     | 75.36%   | 16.54%              | 6.66%     |
| Caa or below  | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 0.00%    | 80.95%              | 19.05%    |
| <b>2-year</b> |            |           |          |            |           |          |                     |           |
| Aaa           | 75.11%     | 0.90%     | 0.27%    | 0.08%      | 0.03%     | 0.00%    | 0.15%               | 23.45%    |
| Aa            | 4.66%      | 77.25%    | 2.66%    | 0.97%      | 0.14%     | 0.06%    | 0.04%               | 14.22%    |
| A             | 0.72%      | 3.83%     | 79.30%   | 3.25%      | 0.98%     | 0.27%    | 0.59%               | 11.06%    |
| Baa           | 0.10%      | 0.27%     | 1.49%    | 77.66%     | 4.00%     | 2.23%    | 3.36%               | 10.90%    |
| Ba            | 0.12%      | 0.32%     | 0.64%    | 1.51%      | 68.02%    | 4.01%    | 12.43%              | 12.95%    |
| B             | 0.30%      | 0.00%     | 0.66%    | 1.02%      | 1.04%     | 59.47%   | 20.15%              | 17.35%    |
| Caa or below  | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 0.00%    | 69.11%              | 30.89%    |
| <b>3-year</b> |            |           |          |            |           |          |                     |           |
| Aaa           | 63.28%     | 1.53%     | 0.44%    | 0.15%      | 0.05%     | 0.00%    | 0.46%               | 34.09%    |
| Aa            | 6.88%      | 62.69%    | 4.35%    | 1.94%      | 0.39%     | 0.15%    | 0.17%               | 23.44%    |
| A             | 1.49%      | 5.70%     | 63.55%   | 5.12%      | 1.83%     | 0.57%    | 1.32%               | 20.41%    |
| Baa           | 0.24%      | 0.50%     | 2.53%    | 59.76%     | 6.12%     | 3.63%    | 7.68%               | 19.54%    |
| Ba            | 0.32%      | 0.59%     | 1.00%    | 2.01%      | 51.87%    | 4.67%    | 17.70%              | 21.85%    |
| B             | 0.73%      | 0.00%     | 1.13%    | 1.54%      | 1.58%     | 44.55%   | 20.96%              | 29.51%    |
| Caa or below  | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 0.00%    | 60.79%              | 39.21%    |
| <b>4-year</b> |            |           |          |            |           |          |                     |           |
| Aaa           | 54.81%     | 2.20%     | 0.57%    | 0.16%      | 0.02%     | 0.00%    | 0.92%               | 41.32%    |
| Aa            | 6.76%      | 50.45%    | 6.14%    | 3.04%      | 0.44%     | 0.11%    | 0.58%               | 32.47%    |
| A             | 2.29%      | 5.44%     | 50.39%   | 6.28%      | 2.64%     | 0.98%    | 1.83%               | 30.15%    |
| Baa           | 0.39%      | 0.77%     | 3.11%    | 44.80%     | 7.22%     | 4.27%    | 12.63%              | 26.82%    |
| Ba            | 0.78%      | 0.70%     | 1.48%    | 2.08%      | 40.42%    | 5.16%    | 20.44%              | 28.93%    |
| B             | 1.61%      | 0.00%     | 1.28%    | 2.24%      | 1.94%     | 33.54%   | 19.65%              | 39.74%    |
| Caa or below  | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 0.00%    | 53.58%              | 46.42%    |
| <b>5-year</b> |            |           |          |            |           |          |                     |           |
| Aaa           | 46.00%     | 2.92%     | 0.77%    | 0.14%      | 0.00%     | 0.00%    | 1.11%               | 49.07%    |
| Aa            | 6.65%      | 39.66%    | 7.09%    | 4.32%      | 0.43%     | 0.10%    | 1.15%               | 40.61%    |
| A             | 3.02%      | 4.79%     | 39.65%   | 6.49%      | 2.45%     | 1.40%    | 2.54%               | 39.67%    |
| Baa           | 0.48%      | 0.94%     | 3.37%    | 35.36%     | 6.64%     | 3.50%    | 17.52%              | 32.17%    |
| Ba            | 1.13%      | 0.54%     | 1.89%    | 1.48%      | 32.38%    | 5.37%    | 20.83%              | 36.37%    |
| B             | 2.40%      | 0.00%     | 1.01%    | 2.75%      | 1.70%     | 24.08%   | 19.67%              | 48.38%    |
| Caa or below  | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 0.00%    | 46.01%              | 53.99%    |

**Figure 46 - US Non-Mortgage ABS Rating Transition Matrices by Cohort Rating (1984-2006)**

| 1-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
|---------------|--------|--------|--------|--------|--------|--------|--------------|--------|
| Aaa           | 84.19% | 0.67%  | 0.13%  | 0.06%  | 0.02%  | 0.02%  | 0.14%        | 14.77% |
| Aa            | 2.34%  | 79.33% | 3.08%  | 1.36%  | 0.48%  | 0.14%  | 0.86%        | 12.41% |
| A             | 0.75%  | 1.57%  | 83.23% | 1.84%  | 0.52%  | 0.17%  | 0.24%        | 11.68% |
| Baa           | 0.73%  | 0.44%  | 2.35%  | 80.46% | 3.11%  | 1.24%  | 1.62%        | 10.05% |
| Ba            | 0.46%  | 0.00%  | 0.19%  | 2.30%  | 71.31% | 7.06%  | 8.62%        | 10.06% |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.35%  | 0.00%  | 67.25% | 27.86%       | 4.54%  |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.07%  | 0.00%  | 0.45%  | 85.45%       | 14.04% |
| <b>2-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 67.94% | 0.96%  | 0.28%  | 0.17%  | 0.08%  | 0.05%  | 0.26%        | 30.26% |
| Aa            | 2.06%  | 61.75% | 4.06%  | 3.21%  | 1.37%  | 0.41%  | 1.91%        | 25.23% |
| A             | 1.32%  | 1.82%  | 67.76% | 2.38%  | 0.85%  | 0.51%  | 0.83%        | 24.54% |
| Baa           | 1.36%  | 0.94%  | 2.24%  | 62.97% | 3.83%  | 2.28%  | 4.27%        | 22.11% |
| Ba            | 0.79%  | 0.00%  | 0.41%  | 1.63%  | 51.56% | 6.35%  | 17.41%       | 21.85% |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.47%  | 0.00%  | 48.33% | 40.40%       | 10.79% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.10%  | 0.00%  | 0.67%  | 69.11%       | 30.12% |
| <b>3-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 51.69% | 0.86%  | 0.38%  | 0.26%  | 0.14%  | 0.08%  | 0.31%        | 46.28% |
| Aa            | 1.43%  | 46.30% | 4.22%  | 4.18%  | 2.00%  | 1.20%  | 2.74%        | 37.93% |
| A             | 1.17%  | 1.38%  | 53.97% | 2.40%  | 1.02%  | 0.63%  | 1.45%        | 37.98% |
| Baa           | 1.20%  | 0.74%  | 1.35%  | 46.46% | 3.34%  | 2.67%  | 6.93%        | 37.31% |
| Ba            | 1.39%  | 0.00%  | 0.27%  | 0.98%  | 36.17% | 5.06%  | 23.62%       | 32.51% |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.54%  | 0.00%  | 31.72% | 48.32%       | 19.42% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.17%  | 0.00%  | 0.88%  | 49.29%       | 49.66% |
| <b>4-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 37.97% | 0.60%  | 0.36%  | 0.29%  | 0.24%  | 0.10%  | 0.36%        | 60.07% |
| Aa            | 0.78%  | 34.53% | 3.54%  | 3.82%  | 1.80%  | 2.02%  | 3.27%        | 50.23% |
| A             | 0.80%  | 0.90%  | 43.32% | 1.64%  | 0.93%  | 0.56%  | 1.82%        | 50.02% |
| Baa           | 0.63%  | 0.20%  | 0.49%  | 34.83% | 2.47%  | 2.30%  | 8.41%        | 50.66% |
| Ba            | 1.58%  | 0.00%  | 0.05%  | 0.05%  | 25.29% | 4.12%  | 24.96%       | 43.94% |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 21.64% | 40.17%       | 38.19% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.37%  | 31.04%       | 68.59% |
| <b>5-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 26.99% | 0.41%  | 0.25%  | 0.23%  | 0.25%  | 0.10%  | 0.32%        | 71.46% |
| Aa            | 0.50%  | 28.29% | 2.89%  | 2.61%  | 1.05%  | 2.03%  | 3.24%        | 59.38% |
| A             | 0.68%  | 0.77%  | 33.89% | 0.91%  | 0.56%  | 0.39%  | 1.78%        | 61.01% |
| Baa           | 0.43%  | 0.17%  | 0.10%  | 27.00% | 1.84%  | 1.63%  | 8.57%        | 60.26% |
| Ba            | 1.75%  | 0.00%  | 0.00%  | 0.00%  | 16.01% | 3.35%  | 19.67%       | 59.22% |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 23.50% | 18.17%       | 58.33% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 12.86%       | 87.14% |

**Figure 47 - US CDO Rating Transition Matrices by Cohort Rating (1990-2006)**

| <b>1-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa or below</b> | <b>WR</b> |
|---------------|------------|-----------|----------|------------|-----------|----------|---------------------|-----------|
| Aaa           | 89.84%     | 2.15%     | 0.62%    | 0.23%      | 0.04%     | 0.01%    | 0.00%               | 7.11%     |
| Aa            | 1.28%      | 85.87%    | 4.17%    | 1.77%      | 0.55%     | 0.25%    | 0.05%               | 6.06%     |
| A             | 0.72%      | 1.17%     | 86.22%   | 2.96%      | 1.20%     | 0.56%    | 0.42%               | 6.74%     |
| Baa           | 0.10%      | 0.28%     | 0.61%    | 84.55%     | 4.07%     | 2.49%    | 2.08%               | 5.83%     |
| Ba            | 0.02%      | 0.09%     | 0.17%    | 0.65%      | 81.45%    | 4.49%    | 6.92%               | 6.22%     |
| B             | 0.00%      | 0.08%     | 0.18%    | 0.45%      | 1.59%     | 71.10%   | 21.40%              | 5.19%     |
| Caa or below  | 0.00%      | 0.00%     | 0.00%    | 0.12%      | 0.11%     | 0.33%    | 94.52%              | 4.91%     |
| <b>2-year</b> |            |           |          |            |           |          |                     |           |
| Aaa           | 77.94%     | 4.58%     | 1.84%    | 0.80%      | 0.25%     | 0.13%    | 0.02%               | 14.45%    |
| Aa            | 1.96%      | 69.84%    | 7.38%    | 4.44%      | 1.93%     | 1.02%    | 0.47%               | 12.96%    |
| A             | 1.15%      | 2.16%     | 71.31%   | 4.28%      | 2.53%     | 1.43%    | 1.91%               | 15.24%    |
| Baa           | 0.17%      | 0.42%     | 0.98%    | 67.21%     | 6.46%     | 4.83%    | 7.53%               | 12.40%    |
| Ba            | 0.00%      | 0.12%     | 0.20%    | 1.15%      | 63.82%    | 6.82%    | 16.28%              | 11.60%    |
| B             | 0.07%      | 0.10%     | 0.31%    | 0.55%      | 2.51%     | 53.01%   | 33.31%              | 10.14%    |
| Caa or below  | 0.00%      | 0.00%     | 0.00%    | 0.18%      | 0.19%     | 0.47%    | 89.43%              | 9.74%     |
| <b>3-year</b> |            |           |          |            |           |          |                     |           |
| Aaa           | 63.90%     | 6.93%     | 3.48%    | 1.64%      | 0.56%     | 0.41%    | 0.09%               | 22.99%    |
| Aa            | 2.01%      | 54.26%    | 9.53%    | 7.06%      | 3.83%     | 1.82%    | 1.45%               | 20.04%    |
| A             | 1.32%      | 2.45%     | 54.59%   | 5.00%      | 3.79%     | 2.52%    | 4.18%               | 26.16%    |
| Baa           | 0.25%      | 0.36%     | 0.96%    | 49.06%     | 7.66%     | 6.78%    | 14.97%              | 19.96%    |
| Ba            | 0.01%      | 0.14%     | 0.15%    | 1.49%      | 46.75%    | 7.67%    | 25.89%              | 17.91%    |
| B             | 0.07%      | 0.13%     | 0.40%    | 0.66%      | 2.29%     | 38.52%   | 43.59%              | 14.34%    |
| Caa or below  | 0.00%      | 0.00%     | 0.00%    | 0.16%      | 0.07%     | 0.53%    | 84.38%              | 14.86%    |
| <b>4-year</b> |            |           |          |            |           |          |                     |           |
| Aaa           | 50.16%     | 8.02%     | 4.66%    | 2.46%      | 0.93%     | 0.85%    | 0.16%               | 32.76%    |
| Aa            | 2.26%      | 39.95%    | 9.87%    | 9.13%      | 5.71%     | 2.58%    | 2.89%               | 27.61%    |
| A             | 0.81%      | 2.46%     | 38.90%   | 4.69%      | 4.38%     | 3.05%    | 6.96%               | 38.75%    |
| Baa           | 0.20%      | 0.38%     | 0.76%    | 33.78%     | 7.53%     | 7.40%    | 22.11%              | 27.84%    |
| Ba            | 0.02%      | 0.00%     | 0.09%    | 1.37%      | 33.28%    | 6.90%    | 33.51%              | 24.82%    |
| B             | 0.00%      | 0.00%     | 0.32%    | 0.09%      | 0.82%     | 28.29%   | 51.39%              | 19.08%    |
| Caa or below  | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 0.00%    | 83.16%              | 16.84%    |
| <b>5-year</b> |            |           |          |            |           |          |                     |           |
| Aaa           | 37.80%     | 7.13%     | 3.69%    | 3.10%      | 1.19%     | 1.21%    | 0.24%               | 45.63%    |
| Aa            | 2.48%      | 29.30%    | 9.15%    | 9.03%      | 6.06%     | 2.41%    | 4.67%               | 36.89%    |
| A             | 0.50%      | 2.58%     | 25.71%   | 2.83%      | 3.86%     | 3.20%    | 8.00%               | 53.33%    |
| Baa           | 0.15%      | 0.24%     | 0.75%    | 22.15%     | 6.78%     | 6.93%    | 26.32%              | 36.67%    |
| Ba            | 0.00%      | 0.00%     | 0.33%    | 1.09%      | 21.75%    | 4.89%    | 38.32%              | 33.62%    |
| B             | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.57%     | 21.41%   | 55.29%              | 22.72%    |
| Caa or below  | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 0.00%    | 85.38%              | 14.62%    |

**Figure 48 - US CDO (excl. HY CBOs) Rating Transition Matrices by Cohort Rating (1990-2006)**

| 1-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
|---------------|--------|--------|--------|--------|--------|--------|--------------|--------|
| Aaa           | 90.69% | 1.29%  | 0.42%  | 0.08%  | 0.03%  | 0.01%  | 0.00%        | 7.47%  |
| Aa            | 0.99%  | 87.89% | 2.91%  | 0.82%  | 0.40%  | 0.21%  | 0.05%        | 6.72%  |
| A             | 0.34%  | 1.02%  | 88.22% | 1.97%  | 0.76%  | 0.36%  | 0.34%        | 7.00%  |
| Baa           | 0.04%  | 0.24%  | 0.47%  | 87.37% | 2.47%  | 1.59%  | 1.39%        | 6.42%  |
| Ba            | 0.00%  | 0.00%  | 0.09%  | 0.60%  | 85.58% | 2.59%  | 3.75%        | 7.39%  |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.03%  | 0.86%  | 74.60% | 16.71%       | 7.79%  |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.19%  | 0.00%  | 0.28%  | 88.11%       | 11.41% |
| <b>2-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 79.75% | 2.69%  | 1.11%  | 0.35%  | 0.20%  | 0.09%  | 0.02%        | 15.78% |
| Aa            | 1.58%  | 73.92% | 5.51%  | 1.95%  | 1.14%  | 0.70%  | 0.31%        | 14.89% |
| A             | 0.60%  | 1.98%  | 74.61% | 2.91%  | 1.50%  | 0.93%  | 1.34%        | 16.13% |
| Baa           | 0.06%  | 0.35%  | 0.80%  | 72.67% | 4.12%  | 2.97%  | 4.87%        | 14.16% |
| Ba            | 0.00%  | 0.00%  | 0.12%  | 1.27%  | 71.28% | 4.07%  | 8.75%        | 14.50% |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.04%  | 1.39%  | 61.36% | 21.94%       | 15.27% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.31%  | 0.00%  | 0.41%  | 74.11%       | 25.17% |
| <b>3-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 66.54% | 4.16%  | 1.95%  | 0.74%  | 0.40%  | 0.22%  | 0.12%        | 25.85% |
| Aa            | 1.68%  | 60.68% | 7.30%  | 2.80%  | 1.91%  | 1.16%  | 0.61%        | 23.85% |
| A             | 0.69%  | 2.37%  | 58.22% | 3.72%  | 2.32%  | 1.33%  | 2.69%        | 28.65% |
| Baa           | 0.08%  | 0.24%  | 0.85%  | 55.94% | 5.33%  | 4.36%  | 9.12%        | 24.08% |
| Ba            | 0.00%  | 0.00%  | 0.09%  | 1.77%  | 56.46% | 4.90%  | 13.14%       | 23.63% |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 1.45%  | 52.22% | 24.20%       | 22.13% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.56%  | 0.00%  | 0.56%  | 56.61%       | 42.27% |
| <b>4-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 51.67% | 5.05%  | 2.74%  | 1.15%  | 0.61%  | 0.34%  | 0.22%        | 38.21% |
| Aa            | 2.03%  | 48.05% | 7.40%  | 3.32%  | 2.65%  | 1.39%  | 0.90%        | 34.25% |
| A             | 0.59%  | 2.35%  | 41.71% | 3.57%  | 2.21%  | 1.51%  | 4.27%        | 43.77% |
| Baa           | 0.06%  | 0.23%  | 0.75%  | 40.50% | 5.83%  | 4.98%  | 12.66%       | 34.99% |
| Ba            | 0.00%  | 0.00%  | 0.02%  | 2.12%  | 43.34% | 4.42%  | 14.67%       | 35.43% |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.93%  | 45.50% | 21.89%       | 31.68% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 46.47%       | 53.53% |
| <b>5-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 36.83% | 3.76%  | 2.00%  | 1.32%  | 0.63%  | 0.33%  | 0.37%        | 54.76% |
| Aa            | 2.47%  | 37.54% | 6.44%  | 2.39%  | 1.72%  | 0.60%  | 1.21%        | 47.63% |
| A             | 0.62%  | 2.22%  | 27.66% | 1.89%  | 1.10%  | 1.65%  | 3.70%        | 61.15% |
| Baa           | 0.08%  | 0.28%  | 0.74%  | 28.21% | 5.94%  | 5.03%  | 11.85%       | 47.87% |
| Ba            | 0.00%  | 0.00%  | 0.44%  | 1.91%  | 29.85% | 3.69%  | 13.88%       | 50.22% |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 1.33%  | 37.07% | 21.20%       | 40.40% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 59.62%       | 40.38% |

**Figure 49 - US CMBS Rating Transition Matrices by Cohort Rating (1987-2006)**

| 1-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
|---------------|--------|--------|--------|--------|--------|--------|--------------|--------|
| Aaa           | 87.18% | 0.78%  | 0.05%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        | 11.99% |
| Aa            | 13.79% | 77.30% | 0.58%  | 0.08%  | 0.02%  | 0.04%  | 0.03%        | 8.17%  |
| A             | 3.26%  | 8.59%  | 81.17% | 1.00%  | 0.09%  | 0.01%  | 0.00%        | 5.87%  |
| Baa           | 0.62%  | 1.30%  | 5.83%  | 81.92% | 1.93%  | 0.25%  | 0.07%        | 8.07%  |
| Ba            | 0.08%  | 0.04%  | 0.44%  | 2.84%  | 89.89% | 2.49%  | 0.24%        | 3.97%  |
| B             | 0.11%  | 0.03%  | 0.03%  | 0.21%  | 0.95%  | 90.22% | 5.80%        | 2.65%  |
| Caa or below  | 0.16%  | 0.00%  | 0.00%  | 0.00%  | 0.11%  | 0.71%  | 90.12%       | 8.89%  |
| <b>2-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 76.98% | 1.35%  | 0.19%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        | 21.48% |
| Aa            | 21.27% | 59.69% | 0.95%  | 0.17%  | 0.12%  | 0.04%  | 0.09%        | 17.67% |
| A             | 6.03%  | 12.78% | 66.26% | 1.56%  | 0.42%  | 0.01%  | 0.04%        | 12.91% |
| Baa           | 1.55%  | 2.49%  | 9.30%  | 65.08% | 2.75%  | 0.51%  | 0.16%        | 18.16% |
| Ba            | 0.11%  | 0.29%  | 0.84%  | 4.81%  | 79.59% | 4.86%  | 0.76%        | 8.74%  |
| B             | 0.07%  | 0.03%  | 0.11%  | 0.46%  | 1.50%  | 78.80% | 12.75%       | 6.26%  |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.28%  | 1.90%  | 80.50%       | 17.32% |
| <b>3-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 68.34% | 1.51%  | 0.44%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        | 29.71% |
| Aa            | 25.87% | 45.98% | 0.98%  | 0.34%  | 0.27%  | 0.04%  | 0.23%        | 26.29% |
| A             | 8.66%  | 15.10% | 54.14% | 1.79%  | 0.74%  | 0.00%  | 0.02%        | 19.56% |
| Baa           | 2.30%  | 3.44%  | 11.53% | 53.07% | 2.87%  | 0.56%  | 0.21%        | 26.03% |
| Ba            | 0.20%  | 0.76%  | 1.00%  | 6.15%  | 69.63% | 7.01%  | 1.57%        | 13.68% |
| B             | 0.03%  | 0.03%  | 0.19%  | 0.65%  | 1.73%  | 66.81% | 19.73%       | 10.82% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.27%  | 3.72%  | 74.41%       | 21.60% |
| <b>4-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 60.61% | 1.66%  | 0.68%  | 0.03%  | 0.00%  | 0.00%  | 0.00%        | 37.02% |
| Aa            | 29.00% | 34.34% | 1.01%  | 0.22%  | 0.44%  | 0.01%  | 0.34%        | 34.64% |
| A             | 11.25% | 16.82% | 43.48% | 1.97%  | 0.63%  | 0.00%  | 0.00%        | 25.85% |
| Baa           | 3.57%  | 4.21%  | 13.58% | 44.49% | 2.99%  | 0.36%  | 0.27%        | 30.53% |
| Ba            | 0.25%  | 1.24%  | 1.16%  | 7.14%  | 59.08% | 8.71%  | 2.77%        | 19.64% |
| B             | 0.00%  | 0.00%  | 0.22%  | 0.88%  | 2.15%  | 55.15% | 25.41%       | 16.19% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 6.16%  | 73.16%       | 20.68% |
| <b>5-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 52.90% | 1.72%  | 0.92%  | 0.15%  | 0.00%  | 0.00%  | 0.00%        | 44.31% |
| Aa            | 31.75% | 22.89% | 1.14%  | 0.17%  | 0.57%  | 0.00%  | 0.38%        | 43.10% |
| A             | 14.21% | 18.64% | 32.32% | 1.69%  | 0.64%  | 0.00%  | 0.00%        | 32.49% |
| Baa           | 5.29%  | 5.45%  | 16.20% | 36.69% | 2.39%  | 0.35%  | 0.40%        | 33.24% |
| Ba            | 0.30%  | 2.11%  | 1.53%  | 8.33%  | 46.71% | 9.19%  | 3.53%        | 28.30% |
| B             | 0.00%  | 0.00%  | 0.33%  | 1.24%  | 2.60%  | 43.88% | 27.86%       | 24.09% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 8.17%  | 67.82%       | 24.01% |

**Figure 50 - US RMBS Rating Transition Matrices by Cohort Rating (1984-2006)**

| 1-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
|---------------|--------|--------|--------|--------|--------|--------|--------------|--------|
| Aaa           | 89.20% | 0.26%  | 0.09%  | 0.01%  | 0.00%  | 0.00%  | 0.00%        | 10.45% |
| Aa            | 7.30%  | 84.06% | 1.26%  | 0.22%  | 0.01%  | 0.01%  | 0.01%        | 7.13%  |
| A             | 1.81%  | 5.74%  | 83.51% | 1.17%  | 0.15%  | 0.05%  | 0.06%        | 7.51%  |
| Baa           | 0.50%  | 0.76%  | 4.96%  | 85.22% | 0.88%  | 0.38%  | 0.33%        | 6.98%  |
| Ba            | 0.15%  | 0.15%  | 1.19%  | 5.62%  | 84.48% | 1.13%  | 1.30%        | 5.99%  |
| B             | 0.00%  | 0.03%  | 0.12%  | 0.55%  | 4.59%  | 85.51% | 2.60%        | 6.62%  |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.22%  | 0.00%  | 89.59%       | 10.19% |
| <b>2-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 76.62% | 0.42%  | 0.16%  | 0.03%  | 0.00%  | 0.00%  | 0.00%        | 22.77% |
| Aa            | 13.72% | 67.39% | 2.25%  | 0.61%  | 0.08%  | 0.02%  | 0.05%        | 15.89% |
| A             | 5.08%  | 9.38%  | 65.05% | 1.76%  | 0.64%  | 0.15%  | 0.23%        | 17.72% |
| Baa           | 1.26%  | 2.20%  | 8.54%  | 68.32% | 1.03%  | 0.90%  | 0.98%        | 16.77% |
| Ba            | 0.31%  | 0.34%  | 3.68%  | 9.46%  | 67.80% | 1.47%  | 2.67%        | 14.26% |
| B             | 0.00%  | 0.03%  | 0.18%  | 1.24%  | 7.58%  | 70.42% | 4.25%        | 16.30% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.50%  | 0.00%  | 80.58%       | 18.92% |
| <b>3-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 65.07% | 0.51%  | 0.18%  | 0.05%  | 0.01%  | 0.00%  | 0.00%        | 34.17% |
| Aa            | 17.89% | 53.31% | 2.81%  | 0.93%  | 0.26%  | 0.06%  | 0.10%        | 24.63% |
| A             | 7.63%  | 10.53% | 50.85% | 1.89%  | 0.59%  | 0.40%  | 0.53%        | 27.57% |
| Baa           | 2.11%  | 2.97%  | 9.18%  | 55.91% | 1.13%  | 1.21%  | 1.70%        | 25.80% |
| Ba            | 0.56%  | 0.42%  | 5.51%  | 10.37% | 55.22% | 1.59%  | 3.78%        | 22.55% |
| B             | 0.08%  | 0.04%  | 0.09%  | 1.94%  | 6.86%  | 58.97% | 6.07%        | 25.94% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.84%  | 0.00%  | 72.33%       | 26.83% |
| <b>4-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 56.68% | 0.51%  | 0.20%  | 0.06%  | 0.03%  | 0.01%  | 0.00%        | 42.51% |
| Aa            | 20.71% | 42.37% | 2.97%  | 1.10%  | 0.33%  | 0.17%  | 0.26%        | 32.10% |
| A             | 8.98%  | 10.51% | 41.54% | 1.82%  | 0.54%  | 0.49%  | 0.84%        | 35.28% |
| Baa           | 2.84%  | 3.17%  | 8.90%  | 48.41% | 1.09%  | 1.35%  | 2.26%        | 31.98% |
| Ba            | 0.63%  | 0.46%  | 5.65%  | 10.73% | 47.08% | 1.49%  | 4.57%        | 29.37% |
| B             | 0.00%  | 0.00%  | 0.00%  | 2.66%  | 3.98%  | 52.33% | 7.69%        | 33.35% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 1.07%  | 0.00%  | 65.78%       | 33.15% |
| <b>5-year</b> |        |        |        |        |        |        |              |        |
| Aaa           | 50.23% | 0.49%  | 0.21%  | 0.10%  | 0.02%  | 0.02%  | 0.00%        | 48.93% |
| Aa            | 22.51% | 33.77% | 2.70%  | 1.09%  | 0.30%  | 0.25%  | 0.47%        | 38.92% |
| A             | 9.88%  | 10.10% | 34.18% | 1.70%  | 0.54%  | 0.50%  | 1.11%        | 41.98% |
| Baa           | 3.42%  | 3.29%  | 9.40%  | 41.89% | 0.93%  | 1.53%  | 2.58%        | 36.97% |
| Ba            | 0.76%  | 0.70%  | 5.77%  | 11.31% | 39.58% | 1.22%  | 5.32%        | 35.34% |
| B             | 0.00%  | 0.00%  | 0.00%  | 3.38%  | 1.88%  | 46.83% | 8.76%        | 39.16% |
| Caa or below  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 1.23%  | 0.00%  | 59.59%       | 39.17% |

**Figure 51 - One-Year Rating Transition Matrices by Cohort Rating by Sector (1997-2006)**

| Global Structured Finance    | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
|------------------------------|--------|--------|--------|--------|--------|--------|--------------|--------|
| Aaa                          | 87.03% | 0.56%  | 0.20%  | 0.07%  | 0.03%  | 0.02%  | 0.04%        | 12.05% |
| Aa                           | 5.33%  | 84.07% | 1.46%  | 0.56%  | 0.16%  | 0.09%  | 0.16%        | 8.17%  |
| A                            | 1.25%  | 3.32%  | 84.75% | 1.67%  | 0.52%  | 0.22%  | 0.25%        | 8.02%  |
| Baa                          | 0.35%  | 0.56%  | 2.89%  | 85.33% | 2.23%  | 0.99%  | 0.96%        | 6.69%  |
| Ba                           | 0.09%  | 0.10%  | 0.55%  | 3.00%  | 83.21% | 3.09%  | 4.04%        | 5.92%  |
| B                            | 0.06%  | 0.04%  | 0.11%  | 0.40%  | 2.24%  | 82.04% | 9.70%        | 5.41%  |
| Caa or below                 | 0.02%  | 0.00%  | 0.00%  | 0.04%  | 0.06%  | 0.37%  | 89.68%       | 9.83%  |
| <b>US ABS</b>                |        |        |        |        |        |        |              |        |
| Aaa                          | 85.19% | 0.68%  | 0.34%  | 0.13%  | 0.08%  | 0.04%  | 0.11%        | 13.42% |
| Aa                           | 2.05%  | 87.99% | 1.89%  | 0.83%  | 0.28%  | 0.17%  | 0.44%        | 6.35%  |
| A                            | 0.54%  | 1.55%  | 86.29% | 1.84%  | 0.68%  | 0.32%  | 0.40%        | 8.38%  |
| Baa                          | 0.20%  | 0.22%  | 1.05%  | 87.79% | 2.69%  | 1.33%  | 1.50%        | 5.23%  |
| Ba                           | 0.05%  | 0.12%  | 0.18%  | 1.82%  | 77.40% | 5.01%  | 10.19%       | 5.23%  |
| B                            | 0.00%  | 0.00%  | 0.13%  | 0.38%  | 0.29%  | 68.75% | 26.04%       | 4.40%  |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.02%  | 0.03%  | 0.14%  | 88.01%       | 11.80% |
| <b>US HEL</b>                |        |        |        |        |        |        |              |        |
| Aaa                          | 87.93% | 0.36%  | 0.14%  | 0.04%  | 0.01%  | 0.00%  | 0.00%        | 11.51% |
| Aa                           | 2.11%  | 91.08% | 0.87%  | 0.18%  | 0.03%  | 0.02%  | 0.00%        | 5.70%  |
| A                            | 0.27%  | 1.57%  | 92.11% | 1.44%  | 0.34%  | 0.08%  | 0.16%        | 4.03%  |
| Baa                          | 0.03%  | 0.13%  | 0.62%  | 91.47% | 1.72%  | 0.97%  | 0.83%        | 4.23%  |
| Ba                           | 0.00%  | 0.12%  | 0.16%  | 1.09%  | 86.25% | 2.56%  | 5.41%        | 4.40%  |
| B                            | 0.00%  | 0.00%  | 0.30%  | 0.60%  | 0.65%  | 74.68% | 17.25%       | 6.52%  |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 81.15%       | 18.85% |
| <b>US Non-Mortgage ABS</b>   |        |        |        |        |        |        |              |        |
| Aaa                          | 83.97% | 0.50%  | 0.16%  | 0.08%  | 0.02%  | 0.03%  | 0.18%        | 15.06% |
| Aa                           | 2.59%  | 79.40% | 3.41%  | 1.65%  | 0.58%  | 0.16%  | 1.03%        | 11.18% |
| A                            | 0.79%  | 1.58%  | 82.28% | 2.03%  | 0.59%  | 0.19%  | 0.27%        | 12.27% |
| Baa                          | 0.74%  | 0.42%  | 2.37%  | 80.11% | 3.13%  | 1.29%  | 1.69%        | 10.25% |
| Ba                           | 0.18%  | 0.00%  | 0.20%  | 2.39%  | 71.06% | 7.32%  | 8.98%        | 9.81%  |
| B                            | 0.00%  | 0.00%  | 0.00%  | 0.36%  | 0.00%  | 67.22% | 28.25%       | 4.17%  |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.07%  | 0.00%  | 0.45%  | 85.45%       | 14.04% |
| <b>US CDOs</b>               |        |        |        |        |        |        |              |        |
| Aaa                          | 90.03% | 2.19%  | 0.63%  | 0.23%  | 0.04%  | 0.01%  | 0.00%        | 6.87%  |
| Aa                           | 1.33%  | 85.54% | 4.30%  | 1.84%  | 0.57%  | 0.27%  | 0.06%        | 6.11%  |
| A                            | 0.74%  | 1.10%  | 86.47% | 3.04%  | 1.24%  | 0.58%  | 0.43%        | 6.39%  |
| Baa                          | 0.10%  | 0.28%  | 0.62%  | 84.45% | 4.16%  | 2.55%  | 2.12%        | 5.72%  |
| Ba                           | 0.02%  | 0.09%  | 0.17%  | 0.65%  | 81.41% | 4.50%  | 6.93%        | 6.23%  |
| B                            | 0.00%  | 0.09%  | 0.19%  | 0.46%  | 1.60%  | 70.92% | 21.54%       | 5.23%  |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.12%  | 0.11%  | 0.33%  | 94.52%       | 4.91%  |
| <b>US CDOs excl. HY CBOs</b> |        |        |        |        |        |        |              |        |
| Aaa                          | 90.96% | 1.31%  | 0.43%  | 0.09%  | 0.03%  | 0.01%  | 0.00%        | 7.16%  |
| Aa                           | 1.04%  | 87.64% | 2.99%  | 0.86%  | 0.42%  | 0.22%  | 0.05%        | 6.78%  |
| A                            | 0.35%  | 0.93%  | 88.57% | 2.03%  | 0.79%  | 0.37%  | 0.35%        | 6.61%  |
| Baa                          | 0.04%  | 0.25%  | 0.48%  | 87.36% | 2.53%  | 1.63%  | 1.42%        | 6.28%  |
| Ba                           | 0.00%  | 0.00%  | 0.09%  | 0.60%  | 85.54% | 2.60%  | 3.76%        | 7.41%  |
| B                            | 0.00%  | 0.00%  | 0.00%  | 0.03%  | 0.87%  | 74.31% | 16.90%       | 7.88%  |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.19%  | 0.00%  | 0.28%  | 88.11%       | 11.41% |
| <b>US CMBS</b>               |        |        |        |        |        |        |              |        |
| Aaa                          | 87.26% | 0.56%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        | 12.18% |
| Aa                           | 14.97% | 76.28% | 0.48%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        | 8.28%  |
| A                            | 3.38%  | 8.91%  | 80.68% | 0.97%  | 0.07%  | 0.01%  | 0.00%        | 5.99%  |
| Baa                          | 0.64%  | 1.31%  | 5.94%  | 81.74% | 1.95%  | 0.26%  | 0.03%        | 8.14%  |
| Ba                           | 0.09%  | 0.04%  | 0.45%  | 2.91%  | 89.78% | 2.53%  | 0.24%        | 3.97%  |
| B                            | 0.12%  | 0.03%  | 0.03%  | 0.22%  | 0.97%  | 90.17% | 5.91%        | 2.56%  |
| Caa or below                 | 0.16%  | 0.00%  | 0.00%  | 0.00%  | 0.12%  | 0.73%  | 90.59%       | 8.40%  |
| <b>US RMBS</b>               |        |        |        |        |        |        |              |        |
| Aaa                          | 87.85% | 0.01%  | 0.06%  | 0.01%  | 0.00%  | 0.00%  | 0.00%        | 12.07% |
| Aa                           | 7.69%  | 82.34% | 0.07%  | 0.06%  | 0.00%  | 0.00%  | 0.02%        | 9.83%  |
| A                            | 2.08%  | 5.28%  | 83.24% | 0.47%  | 0.05%  | 0.04%  | 0.05%        | 8.78%  |
| Baa                          | 0.59%  | 0.85%  | 4.96%  | 84.53% | 0.34%  | 0.27%  | 0.20%        | 8.27%  |
| Ba                           | 0.17%  | 0.18%  | 1.37%  | 5.59%  | 84.46% | 0.43%  | 0.83%        | 6.98%  |
| B                            | 0.00%  | 0.03%  | 0.13%  | 0.56%  | 5.01%  | 85.04% | 1.99%        | 7.24%  |
| Caa or below                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.04%  | 0.00%  | 89.55%       | 10.40% |

Figure 52 - Global Structured Finance One-Year Refined-Rating Transition Matrix by Cohort Rating in 2006

|      | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3   | Caa1  | Caa2  | Caa3 | Ca    | C     | WR   |       |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|------|-------|-------|------|-------|
| Aaa  | 9740  | 91.1% | 0.0%  | 0.1%  | 0.0%  | 0.0%  |       | 0.0%  | 0.0%  | 0.0%  |       |       |       |       |       |       |      |       |       |      |       |       | 8.7% |       |
| Aa1  | 1567  | 7.3%  | 87.0% | 0.3%  | 0.3%  |       | 0.1%  |       |       |       |       |       |       |       |       |       |      |       |       |      |       |       |      | 5.0%  |
| Aa2  | 4207  | 6.1%  | 1.9%  | 86.3% | 0.3%  | 0.2%  | 0.1%  | 0.2%  | 0.0%  |       |       |       |       |       | 0.0%  |       |      |       |       |      |       |       |      | 4.9%  |
| Aa3  | 1548  | 5.6%  | 2.4%  | 3.2%  | 81.3% | 0.4%  | 0.3%  | 0.2%  | 0.1%  | 0.1%  |       |       | 0.1%  |       |       |       |      |       |       |      |       |       |      | 6.5%  |
| A1   | 1384  | 4.1%  | 1.7%  | 2.0%  | 2.0%  | 82.0% | 0.2%  | 0.2%  | 0.1%  | 0.1%  | 0.1%  |       |       |       |       |       | 0.1% |       |       |      |       |       |      | 7.3%  |
| A2   | 4390  | 1.5%  | 1.0%  | 2.2%  | 1.8%  | 1.7%  | 85.5% | 0.2%  | 0.4%  | 0.3%  | 0.3%  | 0.1%  | 0.0%  |       |       |       |      |       |       |      |       |       |      | 5.1%  |
| A3   | 2023  | 1.5%  | 0.7%  | 1.6%  | 2.3%  | 1.8%  | 1.9%  | 84.6% | 0.2%  | 0.5%  | 0.3%  | 0.0%  | 0.0%  |       | 0.1%  | 0.0%  |      |       |       |      |       |       |      | 4.3%  |
| Baa1 | 1816  | 0.7%  | 0.3%  | 0.3%  | 0.8%  | 1.9%  | 2.1%  | 1.9%  | 86.6% | 0.4%  | 0.7%  | 0.2%  | 0.2%  | 0.1%  | 0.1%  |       |      |       |       |      |       |       |      | 3.9%  |
| Baa2 | 4101  | 0.4%  | 0.1%  | 0.2%  | 0.4%  | 0.6%  | 1.8%  | 1.6%  | 1.8%  | 85.7% | 0.6%  | 0.6%  | 0.6%  | 0.3%  | 0.3%  | 0.2%  | 0.1% | 0.0%  | 0.0%  | 0.1% |       | 0.0%  |      | 4.7%  |
| Baa3 | 2251  | 0.3%  | 0.0%  | 0.1%  | 0.3%  | 0.4%  | 0.6%  | 1.5%  | 1.6%  | 2.6%  | 83.0% | 0.5%  | 0.6%  | 0.8%  | 1.0%  | 0.2%  | 0.3% | 0.2%  | 0.2%  | 0.1% | 0.1%  | 0.1%  | 0.1% | 5.5%  |
| Ba1  | 888   | 0.5%  |       | 0.1%  | 0.1%  | 0.1%  | 0.3%  | 0.7%  | 0.9%  | 0.9%  | 2.1%  | 85.5% | 0.6%  | 0.5%  | 1.1%  | 0.5%  | 0.3% |       |       |      | 0.1%  | 0.1%  | 0.1% | 5.4%  |
| Ba2  | 1467  | 0.2%  |       |       |       | 0.1%  |       | 0.1%  | 0.5%  | 2.1%  | 1.6%  | 1.9%  | 86.4% | 0.3%  | 0.5%  | 0.4%  | 0.3% | 0.1%  | 0.3%  | 0.1% | 0.3%  | 0.1%  | 0.1% | 4.8%  |
| Ba3  | 566   | 0.4%  |       |       |       |       | 0.4%  | 0.4%  | 0.4%  | 0.2%  | 2.5%  | 1.6%  | 1.4%  | 82.7% | 0.7%  | 0.7%  | 0.7% | 0.9%  | 0.5%  | 0.5% | 0.7%  |       |      | 5.5%  |
| B1   | 301   |       |       |       |       |       |       | 0.3%  |       | 0.3%  | 0.3%  |       | 1.0%  | 1.0%  | 78.4% | 1.7%  | 2.0% | 1.0%  | 1.7%  | 1.0% | 0.7%  |       |      | 10.6% |
| B2   | 591   |       | 0.2%  |       |       |       | 0.2%  |       |       |       | 0.5%  | 0.5%  | 1.9%  | 2.5%  | 0.7%  | 84.8% | 1.4% | 0.8%  | 1.9%  | 0.7% | 0.8%  | 0.3%  |      | 2.9%  |
| B3   | 331   |       |       |       |       | 0.6%  |       |       |       |       | 0.3%  | 1.2%  | 0.6%  |       |       | 78.2% | 3.3% | 5.1%  | 2.7%  | 1.5% | 0.3%  |       | 6.0% |       |
| Caa1 | 135   |       |       |       |       |       |       |       |       |       |       |       |       | 0.7%  | 1.5%  |       | 0.7% | 74.8% | 5.2%  | 2.2% | 5.9%  | 3.0%  |      | 5.9%  |
| Caa2 | 131   |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 0.8%  | 0.8% | 2.3%  | 58.0% | 5.3% | 13.7% | 10.7% |      | 8.4%  |
| Caa3 | 107   |       |       |       |       |       |       |       |       |       | 0.9%  |       |       |       | 0.9%  |       | 0.9% |       | 55.1% |      | 10.3% | 12.1% |      | 19.6% |
| Ca   | 241   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      | 0.4%  |       |      | 76.8% | 9.1%  |      | 13.7% |
| C    | 402   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |      |       | 93.5% |      | 6.5%  |



**Figure 53 - US ABS One-Year Refined-Rating Transition Matrix by Cohort Rating in 2006**

|      | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1  | Caa2  | Caa3  | Ca    | C     | WR    |      |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|
| Aaa  | 2844  | 89.2% | 0.0%  | 0.1%  |       | 0.0%  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 10.6% |      |
| Aa1  | 587   | 1.4%  | 96.6% |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 2.0% |
| Aa2  | 1611  | 4.0%  | 1.6%  | 89.2% | 0.1%  | 0.2%  | 0.2%  | 0.4%  |       |       |       |       |       |       | 0.1%  |       |       |       |       |       |       |       |       | 4.2% |
| Aa3  | 636   | 1.1%  | 2.0%  | 0.5%  | 93.1% | 0.2%  |       |       | 0.2%  |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 3.0% |
| A1   | 666   | 1.2%  | 1.5%  | 0.6%  | 0.6%  | 90.1% |       | 0.2%  | 0.2%  | 0.2%  |       |       |       |       |       |       | 0.2%  |       |       |       |       |       |       | 5.4% |
| A2   | 1958  | 0.6%  | 0.7%  | 1.8%  | 1.5%  | 0.9%  | 88.0% | 0.2%  | 0.5%  | 0.5%  | 0.4%  | 0.2%  | 0.1%  |       |       |       |       |       |       |       |       |       |       | 4.7% |
| A3   | 969   | 0.2%  | 0.1%  | 0.6%  | 1.2%  | 0.9%  | 0.3%  | 94.4% | 0.1%  | 0.3%  | 0.1%  | 0.1%  |       |       | 0.1%  |       |       |       |       |       |       |       |       | 1.4% |
| Baa1 | 1064  |       |       |       | 0.4%  | 1.1%  | 0.3%  | 0.6%  | 94.7% | 0.1%  | 0.3%  | 0.3%  | 0.4%  | 0.1%  | 0.1%  |       |       |       |       |       |       |       |       | 1.7% |
| Baa2 | 1663  | 0.2%  |       | 0.2%  | 0.1%  | 0.5%  | 1.3%  | 0.7%  | 0.7%  | 87.9% | 1.0%  | 0.8%  | 1.0%  | 0.6%  | 0.7%  | 0.4%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.2%  |       |       | 3.4% |
| Baa3 | 1170  |       |       | 0.1%  | 0.1%  | 0.2%  | 0.4%  | 1.1%  | 0.8%  | 0.8%  | 86.2% | 0.8%  | 0.6%  | 1.1%  | 1.6%  | 0.3%  | 0.5%  | 0.3%  | 0.2%  |       |       | 0.2%  | 0.3%  | 4.5% |
| Ba1  | 407   |       |       |       |       |       |       |       |       | 0.7%  | 0.2%  | 90.7% | 0.5%  | 0.5%  | 1.7%  | 0.7%  | 0.7%  |       | 0.2%  |       | 0.2%  | 0.2%  |       | 3.4% |
| Ba2  | 381   |       |       |       |       |       |       |       |       | 1.3%  | 1.0%  | 0.5%  | 88.7% | 0.3%  | 1.6%  | 0.5%  | 1.0%  | 0.3%  | 0.8%  |       |       | 0.3%  |       | 3.7% |
| Ba3  | 83    |       |       |       |       |       | 1.2%  | 1.2%  |       |       | 4.8%  | 1.2%  |       | 69.9% | 2.4%  | 1.2%  | 2.4%  | 4.8%  | 2.4%  | 3.6%  | 2.4%  |       |       | 2.4% |
| B1   | 35    |       |       |       |       |       |       |       |       |       |       |       |       |       | 71.4% |       |       | 8.6%  | 5.7%  | 5.7%  | 5.7%  | 2.9%  |       |      |
| B2   | 72    |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 76.4% | 2.8%  | 2.8%  | 8.3%  | 1.4%  | 2.8%  | 1.4%  | 2.8%  | 4.2% |
| B3   | 56    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 53.6% | 7.1%  | 21.4% | 7.1%  | 7.1%  |       |       | 3.6% |
| Caa1 | 42    |       |       |       |       |       |       |       |       |       |       |       |       | 2.4%  |       |       |       | 81.0% | 2.4%  |       | 9.5%  |       |       | 4.8% |
| Caa2 | 37    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 64.9% |       | 16.2% | 16.2% |       | 2.7% |
| Caa3 | 43    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 67.4% | 2.3%  | 16.3% | 14.0% |      |
| Ca   | 117   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 79.5% | 6.8%  | 13.7% |      |
| C    | 259   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 93.8% | 6.2%  |      |

Figure 54 - US HEL One-Year Refined-Rating Transition Matrix by Cohort Rating in 2006

|      | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1  | Caa2  | Caa3  | Ca    | C     | WR   |       |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|
| Aaa  | 1706  | 90.7% |       | 0.1%  |       | 0.1%  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 9.2% |       |
| Aa1  | 485   | 0.6%  | 98.1% |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      | 1.2%  |
| Aa2  | 1416  | 3.5%  | 1.1%  | 91.0% | 0.1%  | 0.2%  | 0.2%  | 0.4%  |       |       |       |       |       |       | 0.1%  |       |       |       |       |       |       |       |      | 3.5%  |
| Aa3  | 510   |       | 0.2%  |       | 98.4% | 0.2%  |       |       | 0.2%  |       |       |       |       |       |       |       |       |       |       |       |       |       |      | 1.0%  |
| A1   | 477   | 0.4%  | 0.6%  |       | 0.2%  | 97.5% |       |       |       | 0.2%  |       |       |       |       |       |       | 0.2%  |       |       |       |       |       |      | 0.8%  |
| A2   | 1406  | 0.5%  | 0.4%  | 1.7%  | 1.1%  | 0.6%  | 90.8% | 0.2%  | 0.7%  | 0.6%  | 0.5%  | 0.2%  | 0.1%  |       |       |       |       |       |       |       |       |       |      | 2.6%  |
| A3   | 867   |       | 0.1%  | 0.6%  | 1.2%  | 0.5%  | 0.1%  | 96.0% | 0.1%  | 0.3%  | 0.1%  | 0.1%  |       |       | 0.1%  |       |       |       |       |       |       |       |      | 0.8%  |
| Baa1 | 936   |       |       |       | 0.4%  | 0.9%  | 0.3%  | 0.2%  | 95.9% | 0.1%  | 0.3%  | 0.3%  | 0.3%  | 0.1%  | 0.1%  |       |       |       |       |       |       |       |      | 1.0%  |
| Baa2 | 1354  |       |       |       | 0.1%  | 0.4%  | 1.1%  | 0.5%  | 0.4%  | 89.5% | 1.2%  | 0.9%  | 1.2%  | 0.6%  | 0.8%  | 0.4%  | 0.1%  | 0.1%  | 0.1%  | 0.2%  |       |       |      | 2.3%  |
| Baa3 | 1021  |       |       |       |       | 0.1%  | 0.1%  | 1.1%  | 0.5%  | 0.2%  | 89.3% | 0.5%  | 0.6%  | 1.2%  | 1.9%  | 0.4%  | 0.6%  | 0.4%  | 0.2%  |       | 0.2%  | 0.3%  |      | 2.5%  |
| Ba1  | 357   |       |       |       |       |       |       |       |       |       |       | 96.9% | 0.3%  | 0.3%  | 0.8%  | 0.3%  |       |       |       |       |       |       | 0.3% | 0.8%  |
| Ba2  | 298   |       |       |       |       |       |       |       |       | 1.3%  | 0.7%  |       | 91.6% | 0.3%  | 1.7%  |       | 1.0%  | 0.3%  | 1.0%  |       |       | 0.3%  |      | 1.7%  |
| Ba3  | 42    |       |       |       |       |       |       |       |       |       |       |       |       | 66.7% | 2.4%  | 2.4%  | 4.8%  | 9.5%  | 2.4%  | 7.1%  | 2.4%  |       |      | 2.4%  |
| B1   | 13    |       |       |       |       |       |       |       |       |       |       |       |       |       | 53.8% |       |       | 15.4% | 15.4% | 7.7%  | 7.7%  |       |      |       |
| B2   | 31    |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 83.9% | 3.2%  |       | 9.7%  |       |       |       |      | 3.2%  |
| B3   | 14    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 21.4% | 7.1%  | 50.0% | 14.3% | 7.1%  |       |      |       |
| Caa1 | 8     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 62.5% |       |       | 12.5% |       |      | 25.0% |
| Caa2 | 13    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 92.3% |       |       |       | 7.7% |       |
| Caa3 | 15    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 60.0% | 6.7%  |       |      | 33.3% |
| Ca   | 40    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 57.5% | 7.5%  |      | 35.0% |
| C    | 13    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 92.3% | 7.7% |       |

**Figure 55 - US Non-Mortgage ABS One-Year Refined-Rating Transition Matrix by Cohort Rating in 2006**

|      | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1  | Caa2  | Caa3  | Ca    | C     | WR    |       |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Aaa  | 1055  | 87.2% | 0.1%  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 12.7% |       |
| Aa1  | 89    | 5.6%  | 88.8% |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 5.6%  |
| Aa2  | 153   | 10.5% | 6.5%  | 69.9% |       | 0.7%  | 0.7%  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 11.8% |
| Aa3  | 91    | 7.7%  | 13.2% | 3.3%  | 63.7% |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 12.1% |
| A1   | 180   | 3.3%  | 3.9%  | 2.2%  | 1.7%  | 71.1% |       | 0.6%  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 17.2% |
| A2   | 508   | 0.8%  | 1.6%  | 2.4%  | 2.6%  | 1.8%  | 79.5% |       |       |       | 0.2%  | 0.2%  |       |       |       |       |       |       |       |       |       |       |       | 11.0% |
| A3   | 93    | 2.2%  |       | 1.1%  | 2.2%  | 5.4%  | 2.2%  | 79.6% |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 7.5%  |
| Baa1 | 79    |       |       |       |       | 5.1%  |       | 5.1%  | 78.5% |       |       |       | 1.3%  |       |       |       |       |       |       |       |       |       |       | 10.1% |
| Baa2 | 268   | 1.5%  |       | 1.5%  |       | 1.1%  | 2.6%  | 1.5%  | 2.6%  | 79.1% |       | 0.4%  |       | 0.4%  |       | 0.4%  |       |       |       |       |       |       |       | 9.0%  |
| Baa3 | 133   |       |       | 0.8%  | 0.8%  | 0.8%  | 3.0%  | 1.5%  | 2.3%  | 5.3%  | 64.7% | 0.8%  |       |       |       |       |       |       |       |       |       |       |       | 20.3% |
| Ba1  | 31    |       |       |       |       |       |       |       |       | 3.2%  | 3.2%  | 48.4% |       | 3.2%  | 3.2%  | 3.2%  |       |       |       |       |       | 3.2%  |       | 32.3% |
| Ba2  | 77    |       |       |       |       |       |       |       |       | 1.3%  | 2.6%  | 2.6%  | 77.9% |       | 1.3%  | 2.6%  | 1.3%  |       |       |       |       |       |       | 10.4% |
| Ba3  | 35    |       |       |       |       |       |       | 2.9%  | 2.9%  |       | 11.4% | 2.9%  |       | 71.4% | 2.9%  |       |       |       |       |       |       |       |       | 2.9%  |
| B1   | 11    |       |       |       |       |       |       |       |       |       |       |       |       |       | 81.8% |       | 9.1%  |       |       |       | 9.1%  |       |       |       |
| B2   | 30    |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 66.7% | 3.3%  | 6.7%  | 6.7%  | 3.3%  | 6.7%  |       |       | 6.7%  |
| B3   | 17    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 70.6% | 5.9%  |       |       | 17.6% |       |       | 5.9%  |
| Caa1 | 17    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 88.2% | 5.9%  |       | 5.9%  |       |       |       |
| Caa2 | 13    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 69.2% |       | 15.4% | 7.7%  | 7.7%  |       |
| Caa3 | 23    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 69.6% |       | 26.1% | 4.3%  |       |
| Ca   | 37    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 89.2% | 5.4%  | 5.4%  |       |
| C    | 61    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 86.9% | 13.1% |       |

Figure 56 - US CDO One-Year Refined-Rating Transition Matrix by Cohort Rating in 2006

|      | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2   | B3    | Caa1  | Caa2  | Caa3  | Ca    | C     | WR    |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|
| Aaa  | 916   | 88.8% |       | 0.2%  | 0.1%  |       |       | 0.1%  |       |       |       |       |       |       |       |      |       |       |       |       |       |       | 10.8% |
| Aa1  | 117   | 4.3%  | 82.1% | 0.9%  | 0.9%  |       | 0.9%  |       |       |       |       |       |       |       |       |      |       |       |       |       |       |       | 11.1% |
| Aa2  | 495   | 2.2%  | 1.4%  | 90.3% |       |       | 0.4%  |       |       |       |       |       |       |       |       |      |       |       |       |       |       |       | 5.7%  |
| Aa3  | 89    | 10.1% | 1.1%  |       | 64.0% | 2.2%  | 2.2%  | 2.2%  | 1.1%  |       |       |       | 1.1%  |       |       |      |       |       |       |       |       |       | 15.7% |
| A1   | 102   | 5.9%  | 1.0%  | 2.0%  |       | 77.5% |       | 2.0%  | 1.0%  |       | 1.0%  |       |       |       |       |      | 1.0%  |       |       |       |       |       | 8.8%  |
| A2   | 427   | 0.9%  | 0.5%  |       | 0.7%  |       | 90.2% | 0.2%  | 0.2%  | 0.2%  | 0.5%  | 0.2%  |       |       |       |      |       |       |       |       |       |       | 6.3%  |
| A3   | 259   | 2.3%  | 1.2%  | 1.2%  | 1.2%  | 0.4%  |       | 79.9% |       | 1.2%  | 0.8%  |       | 0.4%  |       | 0.4%  | 0.4% |       |       |       |       |       |       | 10.8% |
| Baa1 | 78    | 5.1%  |       |       |       | 1.3%  | 2.6%  |       | 78.2% | 1.3%  | 2.6%  |       |       |       |       |      |       |       |       |       |       |       | 9.0%  |
| Baa2 | 572   |       | 0.2%  | 0.2%  | 0.9%  | 0.3%  | 0.3%  | 0.3%  | 0.3%  | 88.3% | 0.3%  | 0.7%  | 0.7%  |       |       |      | 0.3%  |       |       |       |       | 0.2%  | 6.8%  |
| Baa3 | 179   | 1.1%  | 0.6%  |       | 1.7%  |       | 1.7%  | 1.1%  |       |       | 78.2% | 0.6%  | 1.1%  | 1.1%  | 1.7%  | 0.6% |       |       |       | 0.6%  |       |       | 10.1% |
| Ba1  | 79    | 1.3%  |       |       | 1.3%  |       | 1.3%  |       | 2.5%  | 1.3%  | 1.3%  | 67.1% |       | 1.3%  | 1.3%  |      |       |       |       | 1.3%  |       |       | 20.3% |
| Ba2  | 244   |       |       |       |       | 0.4%  |       | 0.4%  | 0.4%  |       | 1.2%  |       | 84.0% | 0.4%  | 0.4%  | 0.4% | 0.4%  |       |       |       |       | 0.4%  | 11.5% |
| Ba3  | 99    |       |       |       |       |       | 2.0%  | 1.0%  |       |       | 3.0%  | 2.0%  | 1.0%  | 70.7% |       | 1.0% | 1.0%  | 1.0%  | 1.0%  |       | 1.0%  | 1.0%  | 15.2% |
| B1   | 37    |       |       |       |       |       |       |       |       | 2.7%  | 2.7%  |       |       |       | 48.6% | 8.1% |       |       |       |       | 5.4%  | 2.7%  | 29.7% |
| B2   | 35    |       |       |       |       |       |       |       |       |       | 5.7%  |       |       |       | 5.7%  | 2.9% | 57.1% |       | 2.9%  | 8.6%  | 2.9%  |       | 14.3% |
| B3   | 30    |       |       |       |       |       |       |       |       |       |       | 3.3%  | 3.3%  |       |       |      | 60.0% |       | 3.3%  | 10.0% | 3.3%  | 3.3%  | 13.3% |
| Caa1 | 19    |       |       |       |       |       |       |       |       |       |       |       |       |       | 5.3%  |      | 5.3%  | 63.2% |       |       | 10.5% | 5.3%  | 10.5% |
| Caa2 | 30    |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 3.3% | 3.3%  |       | 43.3% | 3.3%  | 23.3% | 6.7%  | 16.7% |
| Caa3 | 32    |       |       |       |       |       |       |       |       |       | 3.1%  |       |       | 3.1%  |       |      |       |       |       | 46.9% | 21.9% | 6.3%  | 18.8% |
| Ca   | 88    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       | 1.1%  |       |       | 79.5% | 8.0%  | 11.4% |
| C    | 108   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |       |       | 95.4% | 4.6%  |

**Figure 57 - US CDO (excl. HY CBOs) One-Year Refined-Rating Transition Matrix by Cohort Rating in 2006**

|      | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1  | Caa2  | Caa3  | Ca    | C     | WR    |       |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Aaa  | 846   | 90.2% |       | 0.2%  | 0.1%  |       |       | 0.1%  |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 9.3%  |       |
| Aa1  | 109   | 2.8%  | 83.5% | 0.9%  | 0.9%  |       |       | 0.9%  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 11.0% |
| Aa2  | 475   | 1.5%  | 1.1%  | 92.0% |       |       |       | 0.4%  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 5.1%  |
| Aa3  | 75    | 5.3%  | 1.3%  |       | 66.7% | 2.7%  | 2.7%  | 2.7%  | 1.3%  |       |       |       |       | 1.3%  |       |       |       |       |       |       |       |       |       | 16.0% |
| A1   | 92    | 2.2%  | 1.1%  | 2.2%  |       | 84.8% |       | 1.1%  | 1.1%  |       | 1.1%  |       |       |       |       |       |       |       |       |       |       |       |       | 6.5%  |
| A2   | 414   | 0.2%  | 0.5%  |       | 0.7%  |       | 90.8% | 0.2%  | 0.2%  | 0.2%  | 0.5%  | 0.2%  |       |       |       |       |       |       |       |       |       |       |       | 6.3%  |
| A3   | 236   | 1.7%  | 0.8%  | 1.3%  | 1.3%  | 0.4%  |       | 80.9% |       | 1.3%  | 0.8%  |       | 0.4%  |       | 0.4%  | 0.4%  |       |       |       |       |       |       |       | 10.2% |
| Baa1 | 68    | 1.5%  |       |       |       | 1.5%  | 2.9%  |       | 80.9% | 1.5%  | 2.9%  |       |       |       |       |       |       |       |       |       |       |       |       | 8.8%  |
| Baa2 | 541   |       |       | 0.2%  | 0.9%  | 0.4%  | 0.4%  | 0.2%  | 0.4%  | 89.1% | 0.2%  | 0.7%  | 0.7%  |       |       |       | 0.4%  |       |       |       |       |       | 0.2%  | 6.3%  |
| Baa3 | 154   | 0.6%  | 0.6%  |       | 0.6%  |       | 0.6%  | 0.6%  |       |       | 82.5% | 0.6%  | 0.6%  | 1.3%  | 1.9%  |       |       |       |       | 0.6%  |       |       |       | 9.1%  |
| Ba1  | 59    |       |       |       |       |       |       |       |       | 1.7%  |       | 78.0% |       |       | 1.7%  |       |       |       |       |       |       |       |       | 18.6% |
| Ba2  | 215   |       |       |       |       | 0.5%  |       |       | 0.5%  |       |       |       | 87.0% | 0.5%  |       | 0.5%  |       |       |       |       |       |       | 0.5%  | 10.7% |
| Ba3  | 77    |       |       |       |       |       | 1.3%  |       |       |       | 2.6%  | 1.3%  |       | 76.6% |       | 1.3%  |       | 1.3%  |       |       | 1.3%  |       |       | 14.3% |
| B1   | 17    |       |       |       |       |       |       |       |       | 5.9%  |       |       |       |       | 41.2% | 5.9%  |       |       |       |       | 5.9%  |       |       | 35.3% |
| B2   | 22    |       |       |       |       |       |       |       |       |       |       |       |       | 4.5%  | 4.5%  | 59.1% |       |       |       | 4.5%  | 4.5%  |       |       | 22.7% |
| B3   | 21    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 66.7% |       |       |       | 9.5%  | 4.8%  | 4.8%  | 14.3% |
| Caa1 | 8     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 12.5% | 37.5% |       |       | 25.0% |       |       | 25.0% |
| Caa2 | 15    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 46.7% |       | 13.3% | 13.3% |       | 26.7% |
| Caa3 | 21    |       |       |       |       |       |       |       |       |       |       |       |       | 4.8%  |       |       |       |       |       | 52.4% | 19.0% | 9.5%  |       | 14.3% |
| Ca   | 36    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 72.2% | 5.6%  |       | 22.2% |
| C    | 29    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 93.1% | 6.9%  |

Figure 58 - US CMBS One-Year Refined-Rating Transition Matrix by Cohort Rating in 2006

|      | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1  | Caa2  | Caa3  | Ca    | C     | WR    |       |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Aaa  | 690   | 87.8% |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 12.2% |       |
| Aa1  | 136   | 50.7% | 36.0% |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 13.2% |
| Aa2  | 309   | 35.0% | 5.8%  | 52.4% |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 6.8%  |
| Aa3  | 210   | 24.8% | 5.2%  | 9.0%  | 54.3% |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 6.7%  |
| A1   | 140   | 28.6% | 5.7%  | 10.0% | 11.4% | 35.7% |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 8.6%  |
| A2   | 320   | 11.3% | 6.9%  | 6.9%  | 7.2%  | 8.4%  | 52.8% |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 6.6%  |
| A3   | 280   | 7.1%  | 3.6%  | 7.9%  | 7.1%  | 7.5%  | 7.5%  | 55.0% |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 4.3%  |
| Baa1 | 249   | 2.4%  | 1.2%  | 2.4%  | 3.6%  | 5.6%  | 8.0%  | 10.0% | 62.2% | 0.4%  |       |       |       |       |       |       |       |       |       |       |       |       |       | 4.0%  |
| Baa2 | 328   | 2.1%  | 0.6%  | 1.5%  | 1.8%  | 2.4%  | 5.8%  | 9.5%  | 11.3% | 60.4% | 0.3%  |       |       |       |       |       |       |       |       |       |       |       |       | 4.3%  |
| Baa3 | 327   | 0.9%  |       | 0.3%  | 0.9%  | 2.1%  | 1.5%  | 1.5%  | 6.4%  | 10.4% | 69.1% | 0.3%  | 0.6%  | 0.3%  |       |       |       |       |       |       |       |       |       | 5.5%  |
| Ba1  | 236   | 0.8%  |       |       |       | 0.4%  |       | 2.1%  | 1.3%  | 1.7%  | 5.5%  | 83.9% | 0.8%  |       | 0.8%  |       |       |       |       |       |       |       |       | 2.5%  |
| Ba2  | 263   | 0.4%  |       |       |       | 0.4%  |       |       | 0.4%  | 2.7%  | 1.9%  | 5.7%  | 85.6% | 0.4%  |       | 0.4%  |       |       |       | 0.4%  |       |       |       | 1.9%  |
| Ba3  | 232   | 0.4%  |       |       |       |       |       |       |       |       | 1.7%  | 1.7%  | 2.2%  | 90.9% | 0.9%  | 0.4%  | 0.4%  |       |       |       |       |       |       | 1.3%  |
| B1   | 187   |       |       |       |       |       |       |       |       |       |       |       | 1.1%  | 1.1%  | 93.6% | 1.1%  | 1.1%  |       |       | 0.5%  |       |       |       | 1.6%  |
| B2   | 207   |       |       |       |       |       |       |       |       |       |       |       | 1.0%  | 1.4%  | 1.0%  | 92.3% | 2.4%  |       |       | 0.5%  |       | 0.5%  | 0.5%  | 0.5%  |
| B3   | 190   |       |       |       |       |       |       |       |       |       |       |       |       | 0.5%  | 0.5%  |       | 91.1% | 3.7%  | 2.1%  | 1.1%  |       |       |       | 1.1%  |
| Caa1 | 38    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 60.5% | 15.8% | 7.9%  | 5.3%  | 7.9%  |       | 2.6%  |
| Caa2 | 43    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 60.5% | 14.0% | 11.6% | 11.6% |       | 2.3%  |
| Caa3 | 16    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 50.0% | 18.8% | 25.0% |       | 6.3%  |
| Ca   | 15    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 40.0% | 46.7% |       | 13.3% |
| C    | 18    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 88.9% |       | 11.1% |

**Figure 59 - US RMBS One-Year Refined-Rating Transition Matrix by Cohort Rating in 2006**

|      | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3 | Caa1   | Caa2  | Caa3   | Ca     | C     | WR    |       |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|--------|-------|--------|--------|-------|-------|-------|
| Aaa  | 3197  | 97.5% | 0.0%  |       |       |       |       |       |       |       |       |       |       |       |       |       |    |        |       |        |        |       | 2.5%  |       |
| Aa1  | 495   | 4.4%  | 95.4% |       |       |       |       |       |       |       |       |       |       |       |       |       |    |        |       |        |        |       |       | 0.2%  |
| Aa2  | 1053  | 5.0%  | 1.6%  | 90.9% |       |       |       | 0.1%  |       |       |       |       |       |       |       |       |    |        |       |        |        |       |       | 2.4%  |
| Aa3  | 237   | 4.2%  | 0.8%  | 0.8%  | 92.4% |       |       |       |       |       |       |       |       |       |       |       |    |        |       |        |        |       |       | 1.7%  |
| A1   | 135   |       | 2.2%  | 2.2%  | 1.5%  | 93.3% |       |       |       |       |       |       |       |       |       |       |    |        |       |        |        |       |       | 0.7%  |
| A2   | 956   | 0.3%  | 0.1%  | 3.0%  | 1.2%  | 1.9%  | 91.7% | 0.1%  | 0.1%  | 0.1%  | 0.2%  |       |       |       |       |       |    |        |       |        |        |       |       | 1.3%  |
| A3   | 306   | 0.7%  |       |       | 3.6%  | 1.0%  | 2.0%  | 90.8% | 0.3%  |       | 0.3%  |       |       |       |       |       |    |        |       |        |        |       |       | 1.3%  |
| Baa1 | 175   | 0.6%  |       |       |       | 1.7%  | 1.1%  | 0.6%  | 94.9% |       |       | 0.6%  |       |       |       |       |    |        |       |        |        |       |       | 0.6%  |
| Baa2 | 898   | 0.1%  | 0.1%  |       | 0.1%  | 0.3%  | 2.0%  | 1.0%  | 1.0%  | 92.9% |       | 0.3%  | 0.2%  | 0.1%  |       |       |    |        |       |        |        |       |       | 1.8%  |
| Baa3 | 317   | 0.3%  |       |       |       |       |       | 3.5%  | 0.6%  | 0.6%  | 92.7% |       | 0.6%  | 0.3%  |       |       |    |        |       | 0.6%   |        |       |       | 0.6%  |
| Ba1  | 54    |       |       |       |       |       |       |       |       |       | 1.9%  | 98.1% |       |       |       |       |    |        |       |        |        |       |       |       |
| Ba2  | 393   | 0.3%  |       |       |       |       |       |       | 0.8%  | 4.8%  | 1.5%  | 1.0%  | 90.3% |       | 0.3%  | 0.5%  |    |        |       |        |        |       |       | 0.5%  |
| Ba3  | 71    | 1.4%  |       |       |       |       |       |       |       |       | 4.2%  | 1.4%  |       | 88.7% |       | 1.4%  |    |        |       |        |        |       |       | 1.4%  |
| B1   | 11    |       |       |       |       |       |       |       |       |       |       |       |       |       | 81.8% |       |    | 9.1%   |       | 9.1%   |        |       |       |       |
| B2   | 250   |       | 0.4%  |       |       |       |       |       |       |       |       | 1.2%  | 3.6%  | 3.6%  | 0.4%  | 87.2% |    | 0.8%   | 0.4%  | 0.8%   | 0.8%   |       |       | 0.8%  |
| B3   | 32    |       |       |       |       | 6.3%  |       |       |       |       |       |       |       | 6.3%  |       | 87.5% |    |        |       |        |        |       |       |       |
| Caa1 | 25    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |    | 100.0% |       |        |        |       |       |       |
| Caa2 | 7     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |    |        | 85.7% |        |        |       |       | 14.3% |
| Caa3 | 1     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |    |        |       | 100.0% |        |       |       |       |
| Ca   | 6     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |    |        |       |        | 100.0% |       |       |       |
| C    | 9     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |    |        |       |        |        | 77.8% | 22.2% |       |

**Figure 60 - Global Structured Finance One-Year Refined-Rating Transition Matrix by Cohort Rating (1984-2006)**

|      | Total  | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1  | Caa2  | Caa3 | Ca    | C     | WR    |       |
|------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|
| Aaa  | 595711 | 87.7% | 0.3%  | 0.2%  | 0.2%  | 0.1%  | 0.0%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.0%  | 0.0%  | 11.4% |       |
| Aa1  | 55708  | 9.2%  | 78.4% | 0.9%  | 0.6%  | 0.3%  | 0.2%  | 0.2%  | 0.1%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.0%  | 0.0%  | 0.0%  | 9.8%  |
| Aa2  | 221033 | 5.2%  | 1.6%  | 83.9% | 0.8%  | 0.6%  | 0.4%  | 0.4%  | 0.1%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.0%  | 0.0%  | 0.0%  | 6.6%  |
| Aa3  | 73651  | 3.8%  | 2.0%  | 2.2%  | 78.6% | 1.5%  | 1.0%  | 1.1%  | 0.6%  | 0.4%  | 0.3%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.3%  | 0.0%  | 0.0%  | 7.7%  |
| A1   | 65302  | 2.1%  | 0.9%  | 1.8%  | 1.6%  | 78.8% | 1.2%  | 1.0%  | 0.6%  | 0.8%  | 0.4%  | 0.1%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.1%  | 0.1%  | 0.0%  | 0.0% | 0.1%  | 0.0%  | 0.0%  | 10.2% |
| A2   | 214172 | 1.0%  | 0.5%  | 1.8%  | 1.2%  | 1.7%  | 84.3% | 0.4%  | 0.4%  | 0.4%  | 0.3%  | 0.2%  | 0.1%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.0%  | 0.0%  | 0.1%  | 7.3%  |
| A3   | 75445  | 1.1%  | 0.4%  | 0.7%  | 1.5%  | 1.4%  | 1.5%  | 81.5% | 0.8%  | 1.2%  | 1.1%  | 0.5%  | 0.2%  | 0.2%  | 0.2%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.1% | 0.1%  | 0.1%  | 0.1%  | 6.7%  |
| Baa1 | 54715  | 0.5%  | 0.1%  | 0.3%  | 0.3%  | 1.1%  | 1.4%  | 1.5%  | 83.2% | 1.0%  | 1.7%  | 0.9%  | 0.4%  | 0.3%  | 0.4%  | 0.2%  | 0.1%  | 0.2%  | 0.1%  | 0.0% | 0.1%  | 0.2%  | 0.2%  | 5.9%  |
| Baa2 | 174306 | 0.3%  | 0.1%  | 0.3%  | 0.3%  | 0.4%  | 1.7%  | 1.3%  | 1.4%  | 83.7% | 0.9%  | 0.8%  | 0.6%  | 0.5%  | 0.3%  | 0.3%  | 0.3%  | 0.1%  | 0.2%  | 0.1% | 0.2%  | 0.2%  | 0.2%  | 6.1%  |
| Baa3 | 100929 | 0.3%  | 0.0%  | 0.2%  | 0.1%  | 0.3%  | 0.5%  | 0.8%  | 1.0%  | 1.4%  | 82.2% | 1.2%  | 1.0%  | 1.1%  | 0.6%  | 0.4%  | 0.4%  | 0.2%  | 0.2%  | 0.2% | 0.4%  | 0.2%  | 0.2%  | 7.2%  |
| Ba1  | 27696  | 0.2%  | 0.0%  | 0.1%  | 0.0%  | 0.0%  | 0.3%  | 0.5%  | 0.7%  | 1.2%  | 2.7%  | 79.3% | 1.4%  | 2.0%  | 1.2%  | 0.9%  | 1.0%  | 0.3%  | 0.8%  | 0.2% | 0.7%  | 0.4%  | 0.4%  | 5.9%  |
| Ba2  | 64374  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.1%  | 0.2%  | 0.2%  | 0.4%  | 1.6%  | 1.1%  | 1.3%  | 82.7% | 0.8%  | 0.9%  | 0.9%  | 0.8%  | 0.6%  | 0.6%  | 0.5% | 0.7%  | 1.1%  | 1.1%  | 5.6%  |
| Ba3  | 31879  | 0.0%  |       |       | 0.0%  | 0.1%  | 0.2%  | 0.2%  | 0.2%  | 0.3%  | 1.3%  | 0.9%  | 0.8%  | 79.3% | 1.5%  | 1.2%  | 1.7%  | 1.1%  | 1.3%  | 1.0% | 1.3%  | 1.8%  | 1.8%  | 5.8%  |
| B1   | 14489  | 0.1%  | 0.0%  |       | 0.0%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.1%  | 0.2%  | 0.3%  | 0.8%  | 0.8%  | 77.2% | 1.7%  | 3.3%  | 1.7%  | 1.3%  | 1.2% | 1.8%  | 3.1%  | 3.1%  | 6.3%  |
| B2   | 30374  | 0.1%  | 0.0%  |       |       | 0.0%  | 0.1%  | 0.0%  | 0.1%  | 0.1%  | 0.3%  | 0.5%  | 1.5%  | 1.2%  | 0.5%  | 82.6% | 1.6%  | 1.7%  | 1.6%  | 0.5% | 1.5%  | 1.3%  | 4.8%  |       |
| B3   | 19316  | 0.0%  |       | 0.0%  |       | 0.1%  |       |       | 0.1%  |       | 0.2%  | 0.0%  | 0.3%  | 0.5%  | 0.6%  | 0.6%  | 77.8% | 3.0%  | 4.0%  | 1.9% | 3.2%  | 2.4%  | 5.4%  |       |
| Caa1 | 6473   | 0.1%  |       |       |       |       |       |       |       |       | 0.2%  |       | 0.2%  | 0.1%  | 0.8%  |       | 0.0%  | 72.8% | 3.1%  | 4.3% | 6.5%  | 6.6%  | 5.4%  |       |
| Caa2 | 7449   |       |       |       |       |       |       |       |       |       |       |       | 0.2%  |       |       | 0.1%  | 0.6%  | 3.7%  | 66.2% | 4.1% | 8.8%  | 7.6%  | 8.8%  |       |
| Caa3 | 4954   |       |       |       |       |       |       |       |       |       | 0.1%  |       |       | 0.1%  | 0.2%  | 0.2%  | 0.5%  |       | 67.6% | 7.3% | 10.8% | 13.3% |       |       |
| Ca   | 10891  |       |       |       |       |       |       |       |       |       |       |       | 0.0%  |       | 0.1%  |       | 0.1%  |       |       | 0.1% | 78.1% | 10.7% | 10.6% |       |
| C    | 12601  |       |       |       |       |       |       |       | 0.0%  |       |       |       |       |       |       |       |       |       |       |      |       | 89.1% | 10.9% |       |



**Figure 61 - US ABS One-Year Refined-Rating Transition Matrix by Cohort Rating (1984-2006)**

|      | Total  | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1 | Caa2 | Caa3  | Ca    | C     | WR    |       |       |
|------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|-------|-------|-------|-------|-------|-------|
| Aaa  | 207775 | 85.5% | 0.2%  | 0.2%  | 0.3%  | 0.1%  | 0.0%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.0% | 0.1%  | 0.0%  |       | 13.2% |       |       |
| Aa1  | 10797  | 2.1%  | 84.9% | 1.1%  | 1.5%  | 0.6%  | 0.3%  | 0.2%  | 0.1%  | 0.1%  | 0.3%  |       |       |       | 0.0%  | 0.1%  | 0.1%  | 0.0% | 0.1% | 0.0%  | 0.1%  | 0.0%  |       | 8.6%  |       |
| Aa2  | 69232  | 2.8%  | 0.5%  | 87.9% | 0.3%  | 0.5%  | 0.5%  | 0.6%  | 0.1%  | 0.2%  | 0.2%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.0% | 0.0%  | 0.1%  | 0.0%  |       | 6.1%  |       |
| Aa3  | 22776  | 1.4%  | 0.9%  | 0.6%  | 82.3% | 0.7%  | 1.1%  | 1.8%  | 1.0%  | 0.9%  | 0.1%  | 0.1%  | 0.2%  | 0.2%  | 0.2%  | 0.1%  | 0.1%  | 0.1% | 0.0% | 0.0%  | 1.0%  | 0.1%  |       | 6.9%  |       |
| A1   | 29852  | 1.1%  | 0.5%  | 0.7%  | 0.9%  | 81.1% | 0.4%  | 0.7%  | 0.6%  | 1.1%  | 0.5%  | 0.1%  | 0.2%  | 0.0%  | 0.0%  | 0.0%  | 0.1%  | 0.2% | 0.1% | 0.0%  | 0.1%  | 0.1%  |       | 11.6% |       |
| A2   | 110974 | 0.5%  | 0.3%  | 0.8%  | 0.6%  | 1.2%  | 86.7% | 0.2%  | 0.5%  | 0.4%  | 0.3%  | 0.2%  | 0.2%  | 0.1%  | 0.1%  | 0.0%  | 0.1%  | 0.1% | 0.0% | 0.0%  | 0.0%  | 0.1%  |       | 7.4%  |       |
| A3   | 26339  | 0.5%  | 0.1%  | 0.4%  | 0.4%  | 0.6%  | 0.5%  | 83.9% | 0.6%  | 1.2%  | 1.3%  | 0.7%  | 0.2%  | 0.3%  | 0.2%  | 0.2%  | 0.3%  | 0.1% | 0.2% | 0.2%  | 0.2%  | 0.3%  |       | 7.7%  |       |
| Baa1 | 25259  | 0.2%  | 0.1%  | 0.0%  | 0.1%  | 0.2%  | 0.2%  | 0.4%  | 89.1% | 1.0%  | 2.2%  | 0.9%  | 0.4%  | 0.5%  | 0.7%  | 0.3%  | 0.2%  | 0.2% | 0.1% | 0.0%  | 0.2%  | 0.3%  |       | 2.9%  |       |
| Baa2 | 67531  | 0.1%  | 0.0%  | 0.1%  | 0.1%  | 0.3%  | 0.7%  | 0.5%  | 0.9%  | 86.1% | 0.9%  | 0.8%  | 1.0%  | 0.7%  | 0.4%  | 0.4%  | 0.3%  | 0.2% | 0.2% | 0.1%  | 0.4%  | 0.4%  |       | 5.1%  |       |
| Baa3 | 36300  | 0.4%  | 0.0%  | 0.1%  | 0.1%  | 0.1%  | 0.3%  | 0.2%  | 0.4%  | 0.3%  | 84.0% | 1.9%  | 0.9%  | 1.2%  | 0.5%  | 0.6%  | 0.5%  | 0.3% | 0.2% | 0.4%  | 0.8%  | 0.3%  |       | 6.6%  |       |
| Ba1  | 7901   |       |       |       |       |       |       |       | 0.2%  |       | 2.8%  | 75.8% | 2.1%  | 4.1%  | 1.3%  | 1.6%  | 1.8%  | 0.6% | 1.8% | 0.3%  | 1.5%  | 1.4%  |       | 4.5%  |       |
| Ba2  | 15494  | 0.3%  | 0.1%  | 0.1%  | 0.0%  | 0.1%  | 0.2%  |       | 0.2%  | 0.2%  | 0.7%  | 0.3%  | 78.9% | 0.4%  | 1.5%  | 1.8%  | 1.4%  | 1.3% | 1.5% | 0.9%  | 1.7%  | 3.7%  |       | 4.8%  |       |
| Ba3  | 5328   |       |       |       |       |       |       | 0.1%  | 0.6%  | 0.2%  | 1.4%  | 0.6%  |       | 63.9% | 1.2%  | 1.8%  | 3.2%  | 2.9% | 2.1% | 3.4%  | 3.6%  | 6.9%  |       | 7.9%  |       |
| B1   | 1618   |       |       |       |       |       |       |       |       |       |       |       |       |       | 54.1% | 2.2%  | 9.5%  | 4.4% | 2.2% | 3.4%  | 2.9%  | 15.8% |       | 5.6%  |       |
| B2   | 5282   |       |       |       |       | 0.2%  |       |       | 0.2%  | 0.2%  |       |       |       |       | 0.5%  | 75.5% | 1.0%  | 3.0% | 2.8% | 1.2%  | 5.7%  | 6.6%  |       | 3.1%  |       |
| B3   | 2365   |       |       |       |       |       |       |       |       |       | 0.4%  |       |       |       |       |       | 55.6% | 3.4% | 8.5% | 3.3%  | 10.4% | 10.9% |       | 7.6%  |       |
| Caa1 | 1678   |       |       |       |       |       |       |       |       |       | 0.2%  |       |       |       |       |       |       |      |      |       |       |       |       |       |       |
| Caa2 | 2099   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 0.6% |      | 60.8% | 1.3%  | 13.0% | 12.6% |       | 11.7% |
| Caa3 | 2374   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |      |       | 71.1% | 3.9%  | 11.7% |       | 13.3% |
| Ca   | 6099   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |      |       |       | 76.9% | 10.6% |       | 12.2% |
| C    | 7509   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |      |       |       |       | 87.7% |       | 12.3% |

Figure 62 - US HEL One-Year Refined-Rating Transition Matrix by Cohort Rating (1989-2006)

|      | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1  | Caa2  | Caa3  | Ca    | C     | WR    |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Aaa  | 64138 | 88.4% | 0.1%  | 0.2%  | 0.1%  | 0.1%  |       | 0.1%  |       |       | 0.0%  |       |       | 0.0%  |       |       |       |       |       |       |       |       | 11.0% |
| Aa1  | 5193  | 1.4%  | 93.0% | 0.2%  | 0.4%  |       | 0.4%  | 0.5%  |       | 0.2%  | 0.2%  |       |       |       |       |       |       |       |       |       |       |       | 3.9%  |
| Aa2  | 50875 | 2.4%  | 0.3%  | 90.2% | 0.1%  | 0.3%  | 0.4%  | 0.4%  | 0.1%  | 0.0%  | 0.1%  | 0.0%  |       | 0.0%  | 0.0%  |       |       |       |       |       |       |       | 5.6%  |
| Aa3  | 6826  | 0.4%  | 0.2%  | 0.2%  | 90.1% | 0.2%  | 0.4%  | 1.1%  | 0.4%  |       | 0.2%  |       |       |       |       |       |       |       |       |       |       |       | 6.9%  |
| A1   | 5697  | 0.3%  | 0.4%  | 0.3%  | 0.2%  | 93.6% | 0.2%  | 0.2%  |       | 0.1%  | 0.2%  |       |       |       |       |       | 0.1%  |       | 0.4%  |       | 0.2%  |       | 3.8%  |
| A2   | 49200 | 0.4%  | 0.2%  | 1.2%  | 0.8%  | 0.3%  | 90.8% | 0.1%  | 0.8%  | 0.5%  | 0.4%  | 0.1%  | 0.0%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  |       |       | 4.3%  |
| A3   | 13990 |       | 0.0%  | 0.2%  | 0.3%  | 0.1%  | 0.0%  | 94.1% | 0.1%  | 0.4%  | 0.8%  | 0.3%  | 0.2%  | 0.2%  | 0.0%  |       | 0.0%  |       | 0.1%  | 0.1%  | 0.2%  |       | 3.0%  |
| Baa1 | 14957 |       |       |       | 0.1%  | 0.1%  | 0.1%  | 0.2%  | 95.4% | 0.1%  | 0.5%  | 0.6%  | 0.3%  | 0.1%  | 0.2%  | 0.2%  |       | 0.1%  | 0.1%  |       | 0.2%  |       | 1.8%  |
| Baa2 | 41442 | 0.1%  | 0.1%  | 0.1%  | 0.0%  | 0.1%  | 0.5%  | 0.3%  | 0.2%  | 90.5% | 0.4%  | 0.5%  | 0.9%  | 0.6%  | 0.3%  | 0.3%  | 0.2%  | 0.1%  | 0.2%  | 0.1%  | 0.2%  | 0.1%  | 4.3%  |
| Baa3 | 25715 |       | 0.0%  |       | 0.0%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.0%  | 88.5% | 1.0%  | 0.6%  | 0.9%  | 0.6%  | 0.6%  | 0.5%  | 0.2%  | 0.1%  | 0.5%  | 0.7%  | 0.2%  | 5.2%  |
| Ba1  | 5135  |       |       |       |       |       |       | 0.2%  |       |       | 1.2%  | 87.8% | 0.5%  | 1.0%  | 0.6%  | 1.0%  | 0.8%  | 0.5%  | 1.1%  | 0.4%  | 1.4%  | 0.1%  | 3.3%  |
| Ba2  | 8333  |       |       | 0.2%  |       | 0.1%  | 0.1%  |       | 0.1%  | 0.3%  | 0.6%  | 0.1%  | 86.1% | 0.3%  | 1.1%  | 0.3%  | 0.7%  | 0.7%  | 1.3%  | 0.9%  | 0.9%  | 1.4%  | 4.6%  |
| Ba3  | 1410  |       |       |       |       |       |       |       | 0.9%  |       |       |       |       |       | 72.1% | 0.8%  | 1.5%  | 3.8%  | 2.8%  | 0.7%  | 5.5%  | 4.3%  | 7.0%  |
| B1   | 386   |       |       |       |       |       |       |       |       |       |       |       |       | 64.5% |       |       | 0.8%  | 5.4%  | 6.2%  | 1.8%  | 6.7%  | 3.1%  | 11.4% |
| B2   | 3193  |       |       |       |       | 0.4%  |       |       | 0.4%  | 0.4%  |       |       |       | 0.8%  |       | 82.4% | 0.5%  | 0.4%  | 2.3%  | 1.0%  | 3.7%  | 3.5%  | 4.2%  |
| B3   | 731   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 47.7% | 0.5%  | 12.7% | 2.5%  | 9.4%  | 12.3% | 14.8% |
| Caa1 | 423   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 77.5% |       |       | 1.9%  | 3.5%  | 17.0% |
| Caa2 | 877   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 73.3% | 2.1%  | 2.6%  | 3.6%  | 18.4% |
| Caa3 | 1210  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 78.4% | 2.6%  | 5.0%  | 14.0% |
| Ca   | 2979  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 84.6% | 1.0%  | 14.4% |
| C    | 825   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 54.8% | 45.2% |

**Figure 63 - US Non-Mortgage ABS One-Year Refined-Rating Transition Matrix by Cohort Rating (1984-2006)**

|      | Total  | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1  | Caa2  | Caa3  | Ca    | C     | WR    |
|------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Aaa  | 125721 | 84.2% | 0.3%  | 0.2%  | 0.2%  | 0.1%  | 0.0%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.1%  | 0.0%  | 0.0%  | 14.8% |
| Aa1  | 4892   | 1.9%  | 76.9% | 2.3%  | 2.9%  | 1.2%  | 0.1%  |       |       |       | 0.4%  |       |       | 0.0%  |       |       |       |       | 0.0%  |       |       |       | 14.1% |
| Aa2  | 11273  | 2.8%  | 1.6%  | 78.4% | 0.8%  | 1.3%  | 1.1%  | 1.3%  | 0.0%  | 0.5%  | 0.3%  | 0.3%  | 0.2%  | 0.0%  | 0.1%  |       | 0.0%  | 0.0%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 11.0% |
| Aa3  | 7447   | 1.9%  | 1.3%  | 1.4%  | 72.6% | 0.8%  | 0.5%  | 2.0%  | 1.5%  | 1.1%  | 0.1%  | 0.3%  | 0.1%  | 0.3%  | 0.1%  | 0.1%  |       | 0.1%  | 0.0%  | 0.1%  | 1.9%  | 0.1%  | 13.4% |
| A1   | 23516  | 1.1%  | 0.5%  | 0.9%  | 1.0%  | 78.7% | 0.3%  | 0.9%  | 0.8%  | 1.3%  | 0.5%  | 0.1%  | 0.2%  | 0.1%  | 0.1%  |       | 0.0%  | 0.1%  | 0.0%  | 0.0%  | 0.1%  | 0.0%  | 13.5% |
| A2   | 57683  | 0.6%  | 0.3%  | 0.4%  | 0.5%  | 2.2%  | 83.6% | 0.2%  | 0.2%  | 0.4%  | 0.3%  | 0.2%  | 0.2%  | 0.1%  | 0.0%  | 0.1%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.1%  | 10.5% |
| A3   | 10988  | 0.8%  | 0.2%  | 0.6%  | 0.7%  | 1.3%  | 1.0%  | 73.8% | 0.8%  | 2.3%  | 2.0%  | 0.9%  | 0.2%  | 0.3%  | 0.0%  | 0.2%  | 0.1%  | 0.3%  | 0.1%  | 0.1%  | 0.0%  | 0.1%  | 14.1% |
| Baa1 | 4152   | 0.2%  | 0.6%  |       |       | 0.4%  | 0.1%  | 1.5%  | 78.8% | 4.4%  | 2.4%  | 0.3%  | 0.8%  | 0.6%  | 0.5%  | 0.2%  |       | 0.3%  | 0.0%  | 0.2%  | 0.4%  | 0.2%  | 8.2%  |
| Baa2 | 16532  | 0.5%  |       | 0.3%  | 0.1%  | 0.8%  | 1.2%  | 1.0%  | 0.7%  | 77.3% | 2.5%  | 1.7%  | 1.3%  | 0.6%  | 0.6%  | 0.4%  | 0.2%  | 0.4%  | 0.1%  | 0.2%  | 0.4%  | 0.3%  | 9.4%  |
| Baa3 | 8442   | 1.5%  |       | 0.2%  | 0.2%  | 0.1%  | 0.8%  | 0.5%  | 0.7%  | 1.1%  | 76.1% | 0.7%  | 1.1%  | 1.0%  | 0.3%  | 0.7%  | 0.4%  | 0.8%  | 0.2%  | 0.3%  | 0.6%  | 0.3%  | 12.3% |
| Ba1  | 1264   |       |       |       |       |       |       |       |       | 0.2%  | 0.8%  | 56.6% | 2.5%  | 1.4%  | 3.3%  | 4.2%  | 5.1%  | 1.7%  | 5.8%  | 0.5%  | 2.9%  | 0.8%  | 14.4% |
| Ba2  | 4804   | 0.8%  |       |       |       |       | 0.2%  |       | 0.1%  | 0.1%  | 1.3%  | 0.8%  | 73.9% | 0.4%  | 1.5%  | 3.4%  | 2.3%  | 2.0%  | 1.9%  | 0.8%  | 0.9%  | 2.2%  | 7.3%  |
| Ba3  | 2459   |       |       |       |       |       |       | 0.2%  | 0.9%  | 0.5%  | 3.1%  | 1.4%  |       | 68.0% | 1.4%  | 0.5%  | 2.0%  | 2.3%  | 0.4%  | 2.4%  | 1.6%  | 2.2%  | 13.2% |
| B1   | 612    |       |       |       |       |       |       |       |       |       |       |       |       |       | 54.1% | 1.0%  | 13.1% | 5.7%  | 1.8%  | 7.4%  | 2.9%  | 6.5%  | 7.5%  |
| B2   | 1322   |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 71.0% | 0.4%  | 4.8%  | 3.6%  | 2.2%  | 10.4% | 6.3%  | 1.4%  |
| B3   | 887    |       |       |       |       |       |       |       |       |       | 1.1%  |       |       |       |       |       | 60.4% | 4.6%  | 4.5%  | 4.4%  | 9.0%  | 8.7%  | 7.2%  |
| Caa1 | 746    |       |       |       |       |       |       |       |       |       | 0.5%  |       |       |       |       |       |       | 48.4% | 5.0%  | 10.3% | 14.3% | 15.8% | 5.6%  |
| Caa2 | 719    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 1.7%  |       | 55.8% | 1.4%  | 20.3% | 9.0%  | 11.8% |
| Caa3 | 975    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 68.2% | 2.9%  | 13.8% | 15.1% |
| Ca   | 1768   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 0.8%  |       |       |       | 72.3% | 9.7%  | 17.1% |
| C    | 1841   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 85.2% | 14.8% |

**Figure 64 - US CDO One-Year Refined-Rating Transition Matrix by Cohort Rating (1990-2006)**

|      | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1  | Caa2  | Caa3  | Ca    | C     | WR   |      |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|
| Aaa  | 35033 | 89.8% | 0.8%  | 0.8%  | 0.6%  | 0.3%  | 0.1%  | 0.2%  | 0.1%  | 0.1%  | 0.1%  | 0.0%  |       | 0.0%  |       | 0.0%  |       |       |       |       |       |       | 7.1% |      |
| Aa1  | 4246  | 2.3%  | 84.2% | 1.8%  | 1.1%  | 0.8%  | 1.2%  | 0.8%  | 0.1%  | 0.1%  | 0.4%  | 0.2%  |       | 0.1%  | 0.0%  | 0.1%  |       |       |       |       |       |       |      | 6.8% |
| Aa2  | 17837 | 0.9%  | 0.5%  | 85.7% | 2.0%  | 1.7%  | 0.7%  | 0.9%  | 0.6%  | 0.3%  | 0.6%  | 0.1%  | 0.1%  | 0.0%  | 0.1%  | 0.1%  | 0.1%  | 0.0%  |       | 0.0%  | 0.0%  |       |      | 5.5% |
| Aa3  | 5792  | 1.7%  | 0.1%  | 0.3%  | 77.2% | 3.4%  | 2.1%  | 2.5%  | 1.3%  | 0.4%  | 1.7%  | 0.6%  | 0.6%  | 0.5%  | 0.2%  |       | 0.2%  | 0.0%  |       |       |       |       |      | 7.2% |
| A1   | 4264  | 1.8%  | 0.6%  | 1.9%  | 1.0%  | 79.0% | 1.1%  | 1.2%  | 1.2%  | 1.4%  | 1.5%  | 0.6%  | 0.0%  | 0.1%  | 0.1%  |       | 0.4%  | 0.1%  |       |       |       |       | 0.0% | 7.9% |
| A2   | 11326 | 0.7%  | 0.1%  | 0.3%  | 0.3%  | 0.8%  | 86.1% | 1.3%  | 0.5%  | 0.6%  | 0.7%  | 0.3%  | 0.3%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  |       | 0.1%  | 0.1%  |       | 0.0%  |      | 7.6% |
| A3   | 11335 | 0.4%  | 0.1%  | 0.3%  | 0.4%  | 0.1%  | 0.1%  | 86.0% | 0.9%  | 1.3%  | 1.4%  | 0.8%  | 0.6%  | 0.4%  | 0.6%  | 0.3%  | 0.1%  | 0.2%  | 0.1%  | 0.2%  | 0.2%  | 0.2%  | 0.1% | 5.5% |
| Baa1 | 3761  | 0.5%  |       |       | 0.1%  | 1.0%  | 0.6%  | 0.3%  | 80.4% | 0.6%  | 2.0%  | 2.0%  | 0.3%  | 0.7%  | 0.6%  | 0.2%  | 0.3%  | 0.1%  | 0.5%  | 0.1%  | 0.2%  | 0.1%  | 0.1% | 9.4% |
| Baa2 | 22583 | 0.0%  | 0.0%  | 0.1%  | 0.1%  | 0.0%  | 0.1%  | 0.3%  | 0.1%  | 86.1% | 1.3%  | 1.4%  | 0.8%  | 0.8%  | 0.8%  | 0.5%  | 0.8%  | 0.2%  | 0.5%  | 0.5%  | 0.4%  | 0.2%  |      | 4.8% |
| Baa3 | 11257 | 0.1%  | 0.2%  |       | 0.1%  | 0.0%  | 0.2%  | 0.2%  | 0.2%  | 0.1%  | 78.9% | 1.9%  | 2.1%  | 2.5%  | 2.3%  | 0.8%  | 0.8%  | 0.5%  | 0.5%  | 0.6%  | 0.8%  | 0.4%  |      | 6.7% |
| Ba1  | 2751  | 0.1%  | 0.4%  |       | 0.2%  |       | 0.1%  | 0.1%  | 0.9%  | 0.8%  | 0.4%  | 72.7% | 2.9%  | 1.1%  | 3.4%  | 2.2%  | 1.1%  | 0.7%  | 2.6%  | 1.1%  | 1.6%  | 0.1%  |      | 7.3% |
| Ba2  | 10194 |       |       |       |       | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.1%  | 0.4%  | 0.2%  | 83.1% | 1.2%  | 1.4%  | 1.2%  | 1.1%  | 1.0%  | 0.9%  | 1.1%  | 1.2%  | 1.2%  |      | 5.8% |
| Ba3  | 6918  |       |       |       |       |       | 0.2%  | 0.1%  |       | 0.0%  | 0.2%  | 0.3%  | 0.2%  | 78.3% | 2.1%  | 1.0%  | 1.7%  | 1.4%  | 1.9%  | 0.9%  | 2.7%  | 2.5%  |      | 6.4% |
| B1   | 2713  |       |       |       | 0.2%  | 0.4%  | 0.0%  |       | 0.1%  | 0.0%  | 0.4%  | 0.9%  | 0.4%  |       | 63.8% | 2.1%  | 3.5%  | 3.8%  | 3.8%  | 3.8%  | 6.5%  | 6.5%  |      | 3.7% |
| B2   | 2185  |       |       |       |       |       |       |       |       |       | 0.8%  |       | 1.1%  | 0.5%  | 0.0%  | 76.3% | 0.3%  | 2.8%  | 3.3%  | 1.7%  | 4.2%  | 1.3%  |      | 7.6% |
| B3   | 2168  |       |       |       |       |       |       |       |       |       |       |       | 1.3%  | 0.6%  |       | 0.6%  | 67.1% | 1.8%  | 4.9%  | 5.1%  | 8.1%  | 6.0%  |      | 4.7% |
| Caa1 | 963   |       |       |       |       |       |       |       |       |       | 0.6%  |       | 1.2%  |       | 0.3%  |       | 0.1%  | 58.3% | 1.0%  | 8.0%  | 14.3% | 13.4% |      | 2.7% |
| Caa2 | 1352  |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 0.3%  | 0.7%  |       | 60.9% | 5.2%  | 12.9% | 11.7% |      | 8.4% |
| Caa3 | 1344  |       |       |       |       |       |       |       |       |       | 0.4%  |       |       |       | 0.4%  | 0.7%  | 0.2%  |       |       | 61.3% | 14.4% | 12.8% |      | 8.0% |
| Ca   | 3063  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 0.2%  |       |       | 85.6% | 10.4% |      | 3.9% |
| C    | 3845  |       |       |       |       |       |       |       | 0.0%  |       |       |       |       |       |       |       |       |       |       |       |       | 96.0% |      | 4.0% |

**Figure 65 - US CDO (excl. HY CBOs) One-Year Refined-Rating Transition Matrix by Cohort Rating (1990-2006)**

|      | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3  | B1    | B2    | B3    | Caa1  | Caa2  | Caa3  | Ca    | C     | WR   |       |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|
| Aaa  | 28679 | 90.7% | 0.5%  | 0.5%  | 0.3%  | 0.2%  | 0.0%  | 0.2%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  |       |      |       | 0.0%  |       |       |       |       |       |       | 7.5% |       |
| Aa1  | 3667  | 1.8%  | 86.2% | 1.8%  | 0.4%  | 0.9%  | 1.0%  | 0.5%  | 0.1%  | 0.1%  | 0.1%  |       |       |      |       | 0.2%  |       |       |       |       |       |       |      | 7.1%  |
| Aa2  | 14816 | 0.9%  | 0.4%  | 87.9% | 1.4%  | 1.2%  | 0.5%  | 0.6%  | 0.2%  | 0.2%  | 0.3%  | 0.1%  | 0.0%  | 0.0% | 0.0%  | 0.1%  | 0.1%  |       |       | 0.0%  | 0.0%  |       |      | 5.9%  |
| Aa3  | 4359  | 0.8%  | 0.2%  | 0.4%  | 80.7% | 2.6%  | 1.8%  | 0.7%  | 0.9%  | 0.4%  | 0.5%  | 0.5%  | 0.6%  | 0.4% |       |       | 0.2%  | 0.0%  |       |       |       |       |      | 9.2%  |
| A1   | 3685  | 0.5%  | 0.4%  | 1.9%  | 1.2%  | 82.0% | 0.9%  | 1.0%  | 0.8%  | 1.0%  | 0.6%  | 0.4%  | 0.0%  | 0.1% | 0.1%  |       | 0.3%  |       |       |       |       |       |      | 8.7%  |
| A2   | 10480 | 0.4%  | 0.1%  | 0.2%  | 0.3%  | 0.7%  | 87.2% | 1.3%  | 0.5%  | 0.6%  | 0.4%  | 0.2%  | 0.2%  | 0.0% | 0.1%  |       | 0.1%  | 0.1%  | 0.1%  |       |       | 0.0%  |      | 7.4%  |
| A3   | 9223  | 0.1%  | 0.1%  | 0.1%  | 0.2%  | 0.1%  | 0.1%  | 88.7% | 0.5%  | 0.9%  | 1.0%  | 0.5%  | 0.5%  | 0.2% | 0.3%  | 0.2%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.2%  | 0.1%  |      | 5.8%  |
| Baa1 | 3019  | 0.2%  |       |       | 0.1%  | 0.7%  | 0.7%  |       | 83.5% | 0.6%  | 1.6%  | 0.6%  | 0.1%  | 0.2% | 0.3%  | 0.2%  | 0.4%  |       |       | 0.1%  | 0.2%  | 0.2%  |      | 10.3% |
| Baa2 | 18604 | 0.0%  | 0.0%  | 0.1%  | 0.2%  | 0.1%  | 0.1%  | 0.3%  | 0.1%  | 88.7% | 0.8%  | 1.1%  | 0.4%  | 0.4% | 0.3%  | 0.3%  | 0.6%  | 0.2%  | 0.4%  | 0.2%  | 0.2%  | 0.2%  |      | 5.2%  |
| Baa3 | 7352  | 0.1%  | 0.1%  |       | 0.0%  | 0.0%  | 0.1%  | 0.0%  | 0.3%  |       | 82.2% | 1.1%  | 1.1%  | 2.1% | 1.7%  | 0.6%  | 0.5%  | 0.2%  | 0.3%  | 0.5%  | 0.5%  | 0.4%  |      | 8.0%  |
| Ba1  | 1843  |       |       |       |       |       |       |       | 0.7%  | 1.1%  |       | 76.2% | 3.2%  | 0.5% | 2.3%  | 0.3%  | 0.7%  | 0.3%  | 2.8%  | 1.5%  | 1.8%  | 0.2%  |      | 8.5%  |
| Ba2  | 7801  |       |       |       |       | 0.0%  |       |       | 0.1%  | 0.2%  | 0.3%  | 0.2%  | 87.1% | 1.1% | 0.7%  | 0.6%  | 1.0%  | 0.4%  | 0.3%  | 0.7%  | 0.3%  | 0.6%  |      | 6.4%  |
| Ba3  | 4447  |       |       |       |       |       | 0.2%  |       |       | 0.1%  | 0.1%  | 0.2%  |       |      | 82.8% | 0.7%  | 0.8%  | 1.4%  | 0.8%  | 0.8%  | 0.4%  | 1.7%  | 1.5% | 8.6%  |
| B1   | 796   |       |       |       |       |       |       |       | 0.1%  |       |       |       |       |      | 69.2% | 0.6%  | 2.1%  | 0.8%  | 4.8%  | 0.9%  | 7.2%  | 7.7%  |      | 6.7%  |
| B2   | 1414  |       |       |       |       |       |       |       |       |       |       |       | 0.8%  | 0.4% | 0.1%  | 80.2% |       | 0.7%  | 3.7%  | 2.4%  | 1.9%  | 1.1%  |      | 8.6%  |
| B3   | 1267  |       |       |       |       |       |       |       |       |       |       |       | 0.9%  |      |       | 0.9%  | 69.0% | 2.1%  | 3.2%  | 6.0%  | 5.0%  | 5.3%  |      | 7.6%  |
| Caa1 | 309   |       |       |       |       |       |       |       |       |       | 1.9%  |       |       |      |       |       | 0.3%  | 63.4% |       | 10.0% | 7.1%  | 8.7%  |      | 8.4%  |
| Caa2 | 593   |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |       | 62.2% | 6.2%  | 7.6%  | 6.4%  |      | 17.5% |
| Caa3 | 655   |       |       |       |       |       |       |       |       |       |       |       |       | 0.8% |       |       | 0.5%  |       |       | 70.1% | 13.1% | 7.5%  |      | 8.1%  |
| Ca   | 817   |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |       |       |       | 86.9% | 3.5%  |      | 9.5%  |
| C    | 798   |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |       |       |       |       | 87.3% |      | 12.7% |

**Figure 66 - US CMBS One-Year Refined-Rating Transition Matrix by Cohort Rating (1987-2006)**

|      | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1  | Caa2  | Caa3  | Ca    | C     | WR    |       |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Aaa  | 31530 | 87.2% | 0.5%  | 0.2%  | 0.1%  | 0.0%  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 12.0% |       |
| Aa1  | 4614  | 23.5% | 61.1% | 0.3%  | 0.3%  | 0.4%  | 0.0%  |       | 0.0%  |       | 0.2%  |       |       | 0.1%  |       |       |       |       |       |       |       |       |       | 14.0% |
| Aa2  | 22947 | 12.3% | 4.1%  | 75.4% | 0.6%  | 0.2%  | 0.1%  |       |       | 0.0%  | 0.0%  |       |       | 0.0%  |       |       | 0.0%  |       | 0.0%  |       |       |       |       | 7.1%  |
| Aa3  | 6281  | 12.0% | 3.9%  | 5.8%  | 68.8% | 0.7%  |       | 0.8%  |       |       | 0.0%  |       |       |       | 0.1%  |       |       |       | 0.0%  |       |       |       |       | 7.8%  |
| A1   | 5201  | 9.2%  | 3.2%  | 4.7%  | 5.3%  | 63.9% | 0.2%  | 1.1%  | 0.4%  | 0.2%  | 0.3%  | 0.1%  |       | 0.2%  | 0.0%  |       |       |       |       |       |       |       |       | 11.3% |
| A2   | 20582 | 2.6%  | 1.8%  | 3.6%  | 3.8%  | 5.2%  | 76.8% | 0.6%  | 0.3%  | 0.3%  | 0.1%  | 0.0%  | 0.1%  | 0.0%  |       |       |       |       |       |       |       |       |       | 4.9%  |
| A3   | 12342 | 1.8%  | 1.2%  | 1.5%  | 2.9%  | 4.4%  | 5.0%  | 76.3% | 0.4%  | 0.5%  | 0.8%  |       | 0.1%  | 0.0%  |       | 0.0%  |       |       |       |       |       |       |       | 5.2%  |
| Baa1 | 9525  | 1.5%  | 0.3%  | 1.2%  | 1.0%  | 2.5%  | 3.7%  | 4.9%  | 70.9% | 0.6%  | 0.8%  | 1.1%  | 0.1%  | 0.2%  | 0.3%  |       |       |       |       | 0.1%  |       |       |       | 10.8% |
| Baa2 | 22911 | 0.6%  | 0.2%  | 0.7%  | 0.5%  | 0.9%  | 2.4%  | 3.5%  | 4.4%  | 77.2% | 0.8%  | 0.8%  | 0.5%  | 0.2%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 7.2%  |
| Baa3 | 20106 | 0.3%  |       | 0.3%  | 0.2%  | 0.6%  | 0.5%  | 1.2%  | 3.0%  | 4.8%  | 78.2% | 0.9%  | 0.9%  | 0.9%  | 0.1%  | 0.2%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 7.8%  |
| Ba1  | 8424  | 0.3%  |       | 0.1%  |       | 0.0%  | 0.2%  | 0.8%  | 0.5%  | 1.3%  | 3.9%  | 85.3% | 1.1%  | 1.0%  | 0.6%  | 0.1%  | 0.2%  | 0.1%  | 0.0%  | 0.0%  |       |       |       | 4.5%  |
| Ba2  | 12700 | 0.0%  |       |       |       | 0.0%  | 0.1%  | 0.2%  | 0.2%  | 1.0%  | 1.2%  | 2.5%  | 87.0% | 1.5%  | 1.1%  | 0.5%  | 0.6%  | 0.0%  | 0.0%  | 0.0%  |       |       |       | 4.1%  |
| Ba3  | 9607  | 0.0%  |       |       |       |       | 0.1%  | 0.0%  | 0.1%  | 0.0%  | 0.9%  | 0.9%  | 1.4%  | 88.3% | 2.2%  | 1.2%  | 0.9%  | 0.4%  | 0.1%  |       |       | 0.0%  |       | 3.4%  |
| B1   | 6741  | 0.1%  |       |       |       |       |       |       |       | 0.0%  | 0.3%  | 0.1%  | 0.6%  | 0.7%  | 89.8% | 1.8%  | 2.2%  | 0.8%  | 0.3%  | 0.0%  | 0.2%  |       |       | 3.2%  |
| B2   | 11116 | 0.2%  |       |       |       |       | 0.0%  | 0.0%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.6%  | 0.6%  | 0.7%  | 87.0% | 3.4%  | 2.5%  | 1.8%  | 0.2%  | 0.1%  | 0.1%  | 0.1%  | 2.4%  |
| B3   | 8730  | 0.0%  |       | 0.1%  |       |       |       |       |       |       | 0.1%  | 0.0%  | 0.0%  | 0.1%  | 0.6%  | 0.9%  | 84.9% | 4.0%  | 3.8%  | 1.2%  | 1.3%  | 0.4%  |       | 2.6%  |
| Caa1 | 1010  | 0.7%  |       |       |       |       |       |       |       |       |       |       |       |       | 0.6%  |       |       | 64.6% | 9.0%  | 8.7%  | 4.4%  | 6.1%  |       | 5.9%  |
| Caa2 | 2262  |       |       |       |       |       |       |       |       |       |       |       | 0.2%  |       |       |       | 0.8%  | 1.1%  | 75.6% | 5.9%  | 6.9%  | 4.9%  |       | 4.7%  |
| Caa3 | 308   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 54.5% | 14.6% | 19.8% |       |       | 11.0% |
| Ca   | 418   |       |       |       |       |       |       |       |       |       |       |       |       |       | 1.4%  |       |       | 1.4%  |       |       | 48.8% | 35.2% |       | 13.2% |
| C    | 356   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 62.9% |       | 37.1% |

**Figure 67 - US RMBS One-Year Refined-Rating Transition Matrix by Cohort Rating (1984-2006)**

|      | Total  | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1  | Caa2  | Caa3 | Ca    | C     | WR    |       |
|------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|
| Aaa  | 232663 | 89.2% | 0.2%  | 0.1%  | 0.0%  | 0.0%  | 0.1%  | 0.0%  |       | 0.0%  |       |       |       |       |       |       |       |       |       |      |       |       | 10.4% |       |
| Aa1  | 27455  | 11.4% | 78.0% | 0.2%  | 0.0%  | 0.1%  |       | 0.1%  |       | 0.1%  | 0.1%  |       | 0.0%  | 0.0%  |       | 0.0%  | 0.0%  |       | 0.0%  |      |       |       |       | 10.1% |
| Aa2  | 87457  | 6.6%  | 1.9%  | 83.4% | 0.7%  | 0.4%  | 0.4%  | 0.2%  | 0.0%  | 0.1%  | 0.0%  |       | 0.0%  |       | 0.0%  |       |       | 0.0%  |       |      |       |       |       | 6.3%  |
| Aa3  | 25141  | 5.3%  | 2.7%  | 2.0%  | 78.9% | 1.9%  | 1.0%  | 0.6%  | 0.3%  | 0.1%  | 0.2%  | 0.0%  |       |       |       |       |       |       |       |      |       |       |       | 7.0%  |
| A1   | 12579  | 2.9%  | 0.9%  | 2.8%  | 1.3%  | 77.1% | 3.3%  | 1.3%  | 0.5%  | 0.4%  | 0.2%  | 0.0%  |       |       |       |       |       |       |       |      |       |       |       | 9.3%  |
| A2   | 42049  | 1.2%  | 0.6%  | 4.6%  | 1.4%  | 1.1%  | 82.3% | 0.1%  | 0.2%  | 0.3%  | 0.3%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  |       | 0.0%  | 0.0%  |      |       | 0.0%  |       | 7.7%  |
| A3   | 16489  | 2.5%  | 0.3%  | 0.8%  | 3.1%  | 1.4%  | 1.2%  | 82.3% | 0.4%  | 1.2%  | 0.6%  | 0.1%  | 0.1%  | 0.2%  | 0.0%  | 0.0%  | 0.0%  | 0.1%  | 0.1%  |      |       |       |       | 5.6%  |
| Baa1 | 7215   | 0.9%  |       | 0.3%  | 0.3%  | 2.1%  | 2.3%  | 1.6%  | 82.6% | 0.7%  | 1.2%  | 0.6%  | 0.2%  | 0.2%  |       |       |       | 0.2%  | 0.1%  |      | 0.2%  |       |       | 6.4%  |
| Baa2 | 37561  | 0.5%  | 0.1%  | 0.4%  | 0.5%  | 0.6%  | 3.9%  | 1.5%  | 0.9%  | 83.2% | 0.3%  | 0.4%  | 0.2%  | 0.2%  | 0.1%  | 0.1%  | 0.1%  |       | 0.1%  |      | 0.0%  |       |       | 7.0%  |
| Baa3 | 24648  | 0.3%  | 0.1%  | 0.3%  | 0.1%  | 0.6%  | 0.8%  | 1.7%  | 0.6%  | 0.4%  | 85.8% | 0.2%  | 0.4%  | 0.6%  | 0.2%  | 0.1%  | 0.3%  | 0.2%  | 0.4%  | 0.0% | 0.0%  | 0.0%  |       | 7.1%  |
| Ba1  | 4666   | 0.5%  |       |       |       | 0.0%  | 1.5%  | 0.4%  | 1.2%  | 2.3%  | 1.9%  | 80.2% | 0.4%  | 0.8%  | 0.8%  | 0.1%  | 1.3%  | 0.3%  | 0.2%  |      | 0.1%  |       |       | 7.9%  |
| Ba2  | 19675  | 0.1%  | 0.0%  | 0.1%  | 0.1%  | 0.0%  | 0.3%  | 0.5%  | 0.7%  | 4.1%  | 1.4%  | 1.9%  | 83.7% | 0.1%  | 0.1%  | 0.2%  | 0.5%  | 0.1%  | 0.2%  |      | 0.2%  | 0.1%  |       | 5.6%  |
| Ba3  | 7117   | 0.1%  |       |       | 0.2%  | 0.6%  | 0.5%  | 0.6%  | 0.3%  | 1.1%  | 2.7%  | 1.5%  | 0.5%  | 81.1% | 0.1%  | 0.5%  | 0.9%  | 0.3%  | 2.0%  | 0.5% | 0.4%  | 0.4%  |       | 5.8%  |
| B1   | 2475   |       |       |       |       |       |       |       |       | 0.5%  |       |       | 1.4%  | 0.8%  | 83.4% | 0.5%  | 1.9%  | 0.1%  | 0.9%  | 0.1% | 0.5%  |       |       | 9.9%  |
| B2   | 10920  |       | 0.0%  |       |       |       | 0.1%  |       |       | 0.1%  | 0.4%  | 1.2%  | 3.3%  | 2.0%  | 0.5%  | 84.7% | 0.3%  | 0.2%  | 0.4%  | 0.1% | 0.3%  | 0.1%  |       | 6.1%  |
| B3   | 5164   |       |       |       |       | 0.2%  |       |       | 0.2%  |       | 0.5%  |       | 0.2%  | 1.5%  | 0.5%  | 0.2%  | 84.5% | 1.4%  | 2.2%  | 0.7% | 1.2%  | 0.7%  |       | 6.1%  |
| Caa1 | 2346   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 95.5% |       |      | 1.0%  | 0.3%  |       | 3.2%  |
| Caa2 | 1318   |       |       |       |       |       |       |       |       |       |       |       | 0.9%  |       |       |       |       | 14.1% | 67.4% | 3.4% | 1.5%  | 2.7%  |       | 9.9%  |
| Caa3 | 482    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 77.6% |      |       |       |       | 22.4% |
| Ca   | 721    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      | 75.9% | 2.9%  |       | 21.2% |
| C    | 540    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       | 84.4% |       | 15.6% |

## MATRICES BY ORIGINAL RATING<sup>25</sup>

**Figure 68 - Global Structured Finance Rating Transition Matrices by Original Rating (1984-2006)**

| 1-year                                     | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
|--|--------|--------|--------|--------|--------|--------|--------------|--------|
| Aaa  | 98.39% | 0.54%  | 0.06%  | 0.01%  | 0.00%  | 0.01%  | 0.07%        | 0.91%  |
| Aa   | 0.62%  | 97.19% | 0.89%  | 0.14%  | 0.02%  | 0.00%  | 0.09%        | 1.05%  |
| A  | 0.11%  | 0.54%  | 97.31% | 1.05%  | 0.17%  | 0.04%  | 0.04%        | 0.75%  |
| Baa  | 0.04%  | 0.03%  | 0.36%  | 97.95% | 0.66%  | 0.16%  | 0.12%        | 0.68%  |
| Ba   | 0.00%  | 0.00%  | 0.00%  | 0.53%  | 98.15% | 0.48%  | 0.22%        | 0.62%  |
| B  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.56%  | 96.15% | 0.42%        | 2.87%  |
| Caa or below                               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 86.89%       | 13.11% |
| <b>2-year</b>                              |        |        |        |        |        |        |              |        |
| Aaa  | 93.81% | 1.28%  | 0.19%  | 0.13%  | 0.05%  | 0.02%  | 0.13%        | 4.39%  |
| Aa   | 3.87%  | 88.65% | 2.33%  | 0.52%  | 0.10%  | 0.07%  | 0.27%        | 4.18%  |
| A  | 0.89%  | 3.14%  | 89.41% | 2.34%  | 0.42%  | 0.22%  | 0.32%        | 3.26%  |
| Baa  | 0.27%  | 0.27%  | 2.78%  | 88.57% | 1.97%  | 0.50%  | 0.60%        | 5.03%  |
| Ba   | 0.00%  | 0.12%  | 0.20%  | 3.48%  | 89.51% | 1.98%  | 1.82%        | 2.88%  |
| B  | 0.09%  | 0.00%  | 0.09%  | 0.43%  | 3.46%  | 90.40% | 1.47%        | 4.07%  |
| Caa or below                               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 73.91%       | 26.09% |
| <b>3-year</b>                              |        |        |        |        |        |        |              |        |
| Aaa  | 81.72% | 2.09%  | 0.50%  | 0.26%  | 0.15%  | 0.07%  | 0.13%        | 15.08% |
| Aa   | 7.62%  | 74.97% | 3.82%  | 1.59%  | 0.54%  | 0.11%  | 0.41%        | 10.95% |
| A  | 2.46%  | 5.44%  | 75.99% | 3.61%  | 1.24%  | 0.49%  | 0.99%        | 9.79%  |
| Baa  | 0.72%  | 1.15%  | 4.67%  | 72.71% | 3.66%  | 1.89%  | 2.44%        | 12.75% |
| Ba   | 0.00%  | 0.21%  | 1.94%  | 5.24%  | 73.79% | 4.04%  | 6.45%        | 8.33%  |
| B  | 0.11%  | 0.11%  | 0.22%  | 0.43%  | 5.86%  | 77.31% | 7.17%        | 8.79%  |
| Caa or below                               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 2.70%  | 0.00%  | 81.08%       | 16.22% |
| <b>4-year</b>                              |        |        |        |        |        |        |              |        |
| Aaa  | 68.50% | 2.50%  | 0.91%  | 0.40%  | 0.38%  | 0.16%  | 0.28%        | 26.87% |
| Aa   | 11.49% | 60.93% | 4.79%  | 2.47%  | 1.22%  | 0.54%  | 1.01%        | 17.55% |
| A  | 2.80%  | 6.90%  | 60.51% | 4.54%  | 1.74%  | 0.83%  | 2.28%        | 20.40% |
| Baa  | 0.77%  | 1.39%  | 5.68%  | 55.97% | 5.54%  | 2.76%  | 6.35%        | 21.53% |
| Ba   | 0.06%  | 0.45%  | 2.57%  | 6.03%  | 59.44% | 5.26%  | 11.75%       | 14.44% |
| B  | 0.00%  | 0.00%  | 0.14%  | 0.68%  | 5.98%  | 63.99% | 14.81%       | 14.40% |
| Caa or below                               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 2.86%  | 0.00%  | 77.14%       | 20.00% |
| <b>5-year</b>                              |        |        |        |        |        |        |              |        |
| Aaa  | 56.05% | 2.11%  | 0.77%  | 0.48%  | 0.39%  | 0.27%  | 0.50%        | 39.43% |
| Aa   | 14.79% | 48.80% | 5.81%  | 2.82%  | 1.30%  | 0.83%  | 1.75%        | 23.90% |
| A  | 2.75%  | 6.16%  | 50.76% | 3.02%  | 2.06%  | 0.81%  | 2.96%        | 31.48% |
| Baa  | 1.02%  | 1.22%  | 5.42%  | 47.79% | 5.25%  | 2.58%  | 9.12%        | 27.59% |
| Ba   | 0.09%  | 0.35%  | 1.59%  | 6.18%  | 53.05% | 4.94%  | 14.03%       | 19.77% |
| B  | 0.00%  | 0.00%  | 0.18%  | 0.73%  | 3.29%  | 58.68% | 20.48%       | 16.64% |
| Caa or below                               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 3.57%  | 3.57%  | 75.00%       | 17.86% |
| <b>For WR ratings in the 5-year cohort</b> |        |        |        |        |        |        |              |        |
| <b>Rating before WR</b>                    |        |        |        |        |        |        |              |        |
| Aaa  | 95.43% | 3.03%  | 0.82%  | 0.23%  | 0.09%  | 0.00%  | 0.41%        | 0.00%  |
| Aa   | 17.62% | 73.82% | 3.72%  | 1.61%  | 0.74%  | 0.62%  | 1.86%        | 0.00%  |
| A  | 7.03%  | 9.21%  | 75.69% | 3.89%  | 1.80%  | 0.76%  | 1.61%        | 0.00%  |
| Baa  | 5.63%  | 3.95%  | 8.38%  | 68.26% | 5.51%  | 2.51%  | 5.75%        | 0.00%  |
| Ba   | 0.89%  | 1.79%  | 4.46%  | 9.38%  | 63.84% | 8.48%  | 11.16%       | 0.00%  |
| B  | 0.00%  | 0.00%  | 1.10%  | 10.99% | 10.99% | 46.15% | 30.77%       | 0.00%  |
| Caa or below                               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 20.00% | 0.00%  | 80.00%       | 0.00%  |

25. The bottom-most matrix in the matrices by original rating contains information about the withdrawn ratings (last column) from the 5-year cohort. The row represents the original rating of the withdrawn security and the column shows the rating prior to withdrawal. See Appendix II for more details.



**Figure 69 - US ABS Rating Transition Matrices by Original Rating (1984-2006)**

| 1-year                                     | Aaa                     | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
|--|-------------------------|--------|--------|--------|--------|--------|--------------|--------|
| Aaa  | 99.26%                  | 0.21%  | 0.00%  | 0.02%  | 0.00%  | 0.02%  | 0.19%        | 0.31%  |
| Aa   | 0.26%                   | 98.76% | 0.26%  | 0.06%  | 0.03%  | 0.00%  | 0.26%        | 0.37%  |
| A  | 0.04%                   | 0.22%  | 98.74% | 0.66%  | 0.04%  | 0.04%  | 0.02%        | 0.24%  |
| Baa  | 0.00%                   | 0.00%  | 0.15%  | 99.01% | 0.47%  | 0.09%  | 0.04%        | 0.24%  |
| Ba   | 0.00%                   | 0.00%  | 0.00%  | 0.83%  | 97.62% | 0.72%  | 0.21%        | 0.62%  |
| B  | 0.00%                   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 97.85% | 2.15%        | 0.00%  |
| Caa or below                               | 0.00%                   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 100.00%      | 0.00%  |
| <b>2-year</b>                              |                         |        |        |        |        |        |              |        |
| Aaa  | 94.34%                  | 1.09%  | 0.17%  | 0.02%  | 0.10%  | 0.02%  | 0.35%        | 3.90%  |
| Aa   | 0.97%                   | 93.79% | 1.15%  | 0.74%  | 0.05%  | 0.05%  | 0.83%        | 2.44%  |
| A  | 0.42%                   | 1.73%  | 93.32% | 2.10%  | 0.31%  | 0.17%  | 0.36%        | 1.59%  |
| Baa  | 0.13%                   | 0.03%  | 1.37%  | 92.25% | 1.81%  | 0.63%  | 0.57%        | 3.21%  |
| Ba   | 0.00%                   | 0.00%  | 0.00%  | 2.00%  | 85.83% | 3.59%  | 4.79%        | 3.79%  |
| B  | 0.00%                   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 93.98% | 4.82%        | 1.20%  |
| Caa or below                               | 0.00%                   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 100.00%      | 0.00%  |
| <b>3-year</b>                              |                         |        |        |        |        |        |              |        |
| Aaa  | 81.24%                  | 2.07%  | 0.65%  | 0.12%  | 0.27%  | 0.15%  | 0.33%        | 15.18% |
| Aa   | 4.30%                   | 81.02% | 2.91%  | 2.45%  | 0.73%  | 0.13%  | 1.39%        | 7.08%  |
| A  | 1.99%                   | 3.46%  | 80.56% | 4.06%  | 1.13%  | 0.49%  | 1.28%        | 7.03%  |
| Baa  | 1.02%                   | 0.68%  | 2.29%  | 79.08% | 4.23%  | 2.34%  | 3.26%        | 7.10%  |
| Ba   | 0.00%                   | 0.00%  | 0.59%  | 1.48%  | 64.50% | 5.03%  | 17.46%       | 10.95% |
| B  | 0.00%                   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 67.53% | 24.68%       | 7.79%  |
| Caa or below                               | 0.00%                   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 50.00%       | 50.00% |
| <b>4-year</b>                              |                         |        |        |        |        |        |              |        |
| Aaa  | 66.17%                  | 2.06%  | 0.77%  | 0.35%  | 0.63%  | 0.28%  | 0.66%        | 29.09% |
| Aa   | 5.74%                   | 65.30% | 4.46%  | 3.17%  | 1.71%  | 0.86%  | 3.17%        | 15.60% |
| A  | 1.23%                   | 3.56%  | 64.56% | 5.17%  | 1.90%  | 0.95%  | 2.89%        | 19.73% |
| Baa  | 0.64%                   | 0.57%  | 2.12%  | 57.86% | 8.92%  | 3.90%  | 8.92%        | 17.07% |
| Ba   | 0.00%                   | 1.00%  | 0.33%  | 2.33%  | 48.00% | 4.67%  | 25.67%       | 18.00% |
| B  | 0.00%                   | 0.00%  | 1.39%  | 0.00%  | 1.39%  | 48.61% | 23.61%       | 25.00% |
| Caa or below                               | 0.00%                   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 50.00%       | 50.00% |
| <b>5-year</b>                              |                         |        |        |        |        |        |              |        |
| Aaa  | 49.61%                  | 1.46%  | 0.53%  | 0.57%  | 0.53%  | 0.41%  | 1.14%        | 45.76% |
| Aa   | 5.05%                   | 50.44% | 6.37%  | 4.18%  | 1.21%  | 1.43%  | 4.51%        | 26.81% |
| A  | 1.68%                   | 2.44%  | 50.93% | 2.85%  | 2.44%  | 0.99%  | 3.72%        | 34.96% |
| Baa  | 0.58%                   | 0.48%  | 1.84%  | 46.62% | 7.93%  | 3.58%  | 12.86%       | 26.11% |
| Ba   | 0.00%                   | 0.89%  | 0.44%  | 3.11%  | 36.44% | 4.44%  | 31.11%       | 23.56% |
| B  | 0.00%                   | 0.00%  | 1.47%  | 1.47%  | 4.41%  | 38.24% | 16.18%       | 38.24% |
| Caa or below                               |                         |        |        |        |        |        |              |        |
| <b>For WR ratings in the 5-year cohort</b> |                         |        |        |        |        |        |              |        |
|  | <b>Rating before WR</b> |        |        |        |        |        |              |        |
| Aaa  | 96.01%                  | 2.48%  | 0.53%  | 0.18%  | 0.09%  | 0.00%  | 0.71%        | 0.00%  |
| Aa   | 13.52%                  | 76.64% | 3.28%  | 1.23%  | 0.00%  | 0.41%  | 4.92%        | 0.00%  |
| A  | 6.31%                   | 5.81%  | 82.56% | 2.99%  | 0.33%  | 0.33%  | 1.66%        | 0.00%  |
| Baa  | 9.26%                   | 2.96%  | 5.93%  | 71.11% | 1.48%  | 1.11%  | 8.15%        | 0.00%  |
| Ba   | 0.00%                   | 1.89%  | 1.89%  | 1.89%  | 73.58% | 5.66%  | 15.09%       | 0.00%  |
| B  | 0.00%                   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 19.23% | 80.77%       | 0.00%  |
| Caa or below                               |                         |        |        |        |        |        |              |        |

**Figure 70 - US HEL Rating Transition Matrices by Original Rating (1989-2006)**

| 1-year                                     | Aaa                     | Aa     | A      | Baa    | Ba     | B       | Caa or below | WR     |
|--|-------------------------|--------|--------|--------|--------|---------|--------------|--------|
| Aaa  | 99.67%                  | 0.05%  | 0.00%  | 0.00%  | 0.00%  | 0.00%   | 0.00%        | 0.29%  |
| Aa   | 0.07%                   | 99.60% | 0.07%  | 0.00%  | 0.00%  | 0.00%   | 0.00%        | 0.26%  |
| A  | 0.00%                   | 0.07%  | 99.83% | 0.00%  | 0.00%  | 0.00%   | 0.00%        | 0.10%  |
| Baa  | 0.00%                   | 0.00%  | 0.05%  | 99.62% | 0.11%  | 0.00%   | 0.00%        | 0.22%  |
| Ba   | 0.00%                   | 0.00%  | 0.00%  | 0.14%  | 99.58% | 0.00%   | 0.00%        | 0.28%  |
| B  | 0.00%                   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 100.00% | 0.00%        | 0.00%  |
| Caa or below                               |                         |        |        |        |        |         |              |        |
| <b>2-year</b>                              |                         |        |        |        |        |         |              |        |
| Aaa  | 93.80%                  | 0.07%  | 0.00%  | 0.00%  | 0.00%  | 0.00%   | 0.00%        | 6.13%  |
| Aa   | 0.47%                   | 97.05% | 0.47%  | 0.07%  | 0.00%  | 0.00%   | 0.00%        | 1.94%  |
| A  | 0.00%                   | 0.29%  | 98.46% | 0.29%  | 0.00%  | 0.00%   | 0.00%        | 0.97%  |
| Baa  | 0.00%                   | 0.00%  | 0.13%  | 95.10% | 0.83%  | 0.22%   | 0.04%        | 3.67%  |
| Ba   | 0.00%                   | 0.00%  | 0.00%  | 0.36%  | 94.91% | 1.09%   | 1.82%        | 1.82%  |
| B  | 0.00%                   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 94.55%  | 3.64%        | 1.82%  |
| Caa or below                               |                         |        |        |        |        |         |              |        |
| <b>3-year</b>                              |                         |        |        |        |        |         |              |        |
| Aaa  | 74.80%                  | 0.79%  | 0.40%  | 0.00%  | 0.10%  | 0.00%   | 0.00%        | 23.91% |
| Aa   | 4.67%                   | 86.11% | 1.22%  | 0.78%  | 0.22%  | 0.11%   | 0.00%        | 6.89%  |
| A  | 0.00%                   | 4.26%  | 89.55% | 1.62%  | 0.41%  | 0.00%   | 0.20%        | 3.96%  |
| Baa  | 0.00%                   | 0.15%  | 2.01%  | 84.85% | 2.86%  | 1.39%   | 1.16%        | 7.57%  |
| Ba   | 0.00%                   | 0.00%  | 0.00%  | 0.74%  | 83.70% | 2.22%   | 5.93%        | 7.41%  |
| B  | 0.00%                   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 74.07%  | 14.81%       | 11.11% |
| Caa or below                               |                         |        |        |        |        |         |              |        |
| <b>4-year</b>                              |                         |        |        |        |        |         |              |        |
| Aaa  | 70.82%                  | 1.43%  | 0.57%  | 0.43%  | 0.14%  | 0.00%   | 0.43%        | 26.18% |
| Aa   | 7.58%                   | 73.06% | 4.35%  | 1.45%  | 0.48%  | 0.32%   | 0.65%        | 12.10% |
| A  | 0.33%                   | 6.51%  | 73.79% | 5.68%  | 2.17%  | 0.67%   | 0.83%        | 10.02% |
| Baa  | 0.14%                   | 0.27%  | 2.45%  | 59.67% | 10.22% | 4.50%   | 6.95%        | 15.80% |
| Ba   | 0.00%                   | 1.68%  | 0.00%  | 3.36%  | 62.18% | 5.04%   | 12.61%       | 15.13% |
| B  | 0.00%                   | 0.00%  | 1.92%  | 0.00%  | 1.92%  | 55.77%  | 15.38%       | 25.00% |
| Caa or below                               |                         |        |        |        |        |         |              |        |
| <b>5-year</b>                              |                         |        |        |        |        |         |              |        |
| Aaa  | 64.53%                  | 2.00%  | 0.60%  | 0.20%  | 0.00%  | 0.00%   | 1.40%        | 31.26% |
| Aa   | 5.36%                   | 56.41% | 7.69%  | 3.26%  | 0.70%  | 0.00%   | 0.70%        | 25.87% |
| A  | 1.73%                   | 6.44%  | 57.67% | 5.20%  | 4.21%  | 1.73%   | 1.49%        | 21.53% |
| Baa  | 0.22%                   | 0.22%  | 3.36%  | 48.10% | 8.72%  | 3.58%   | 12.75%       | 23.04% |
| Ba   | 0.00%                   | 1.03%  | 1.03%  | 5.15%  | 51.55% | 3.09%   | 15.46%       | 22.68% |
| B  | 0.00%                   | 0.00%  | 2.00%  | 2.00%  | 6.00%  | 44.00%  | 6.00%        | 40.00% |
| Caa or below                               |                         |        |        |        |        |         |              |        |
| <b>For WR ratings in the 5-year cohort</b> |                         |        |        |        |        |         |              |        |
|  | <b>Rating before WR</b> |        |        |        |        |         |              |        |
| Aaa  | 99.36%                  | 0.64%  | 0.00%  | 0.00%  | 0.00%  | 0.00%   | 0.00%        | 0.00%  |
| Aa   | 18.02%                  | 77.48% | 0.00%  | 0.00%  | 0.00%  | 0.90%   | 3.60%        | 0.00%  |
| A  | 1.15%                   | 9.20%  | 85.06% | 2.30%  | 1.15%  | 0.00%   | 1.15%        | 0.00%  |
| Baa  | 0.97%                   | 2.91%  | 8.74%  | 66.99% | 2.91%  | 2.91%   | 14.56%       | 0.00%  |
| Ba   | 0.00%                   | 4.55%  | 0.00%  | 4.55%  | 54.55% | 13.64%  | 22.73%       | 0.00%  |
| B  | 0.00%                   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 10.00%  | 90.00%       | 0.00%  |
| Caa or below                               |                         |        |        |        |        |         |              |        |

**Figure 71 - US Non-Mortgage ABS Rating Transition Matrices by Original Rating (1984-2006)**

| 1-year                                     | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
|--|--------|--------|--------|--------|--------|--------|--------------|--------|
| Aaa  | 98.89% | 0.36%  | 0.00%  | 0.04%  | 0.00%  | 0.04%  | 0.36%        | 0.32%  |
| Aa   | 1.29%  | 94.28% | 1.11%  | 0.37%  | 0.18%  | 0.00%  | 1.66%        | 1.11%  |
| A  | 0.05%  | 0.43%  | 97.12% | 1.66%  | 0.11%  | 0.11%  | 0.05%        | 0.48%  |
| Baa  | 0.00%  | 0.00%  | 0.71%  | 97.00% | 1.43%  | 0.14%  | 0.29%        | 0.43%  |
| Ba   | 0.00%  | 0.00%  | 0.00%  | 2.55%  | 91.33% | 3.06%  | 1.02%        | 2.04%  |
| B  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 96.55% | 3.45%        | 0.00%  |
| Caa or below                               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 100.00%      | 0.00%  |
| <b>2-year</b>                              |        |        |        |        |        |        |              |        |
| Aaa  | 95.29% | 1.47%  | 0.09%  | 0.04%  | 0.04%  | 0.04%  | 0.61%        | 2.42%  |
| Aa   | 3.03%  | 83.98% | 2.38%  | 2.16%  | 0.22%  | 0.22%  | 3.25%        | 4.76%  |
| A  | 0.81%  | 3.23%  | 88.45% | 3.93%  | 0.46%  | 0.23%  | 0.58%        | 2.31%  |
| Baa  | 0.67%  | 0.17%  | 6.66%  | 83.53% | 3.16%  | 1.16%  | 1.83%        | 2.83%  |
| Ba   | 0.00%  | 0.00%  | 0.00%  | 4.60%  | 77.59% | 5.17%  | 4.60%        | 8.05%  |
| B  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 96.15% | 3.85%        | 0.00%  |
| Caa or below                               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 100.00%      | 0.00%  |
| <b>3-year</b>                              |        |        |        |        |        |        |              |        |
| Aaa  | 85.16% | 2.21%  | 0.23%  | 0.14%  | 0.05%  | 0.14%  | 0.47%        | 11.60% |
| Aa   | 3.80%  | 70.63% | 5.32%  | 5.82%  | 0.76%  | 0.25%  | 3.04%        | 10.38% |
| A  | 3.03%  | 3.03%  | 76.11% | 5.50%  | 1.07%  | 0.63%  | 1.33%        | 9.29%  |
| Baa  | 4.21%  | 2.40%  | 3.41%  | 67.54% | 3.81%  | 3.41%  | 5.81%        | 9.42%  |
| Ba   | 0.00%  | 0.00%  | 0.66%  | 1.99%  | 57.62% | 5.30%  | 17.22%       | 17.22% |
| B  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 57.14% | 42.86%       | 0.00%  |
| Caa or below                               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 50.00%       | 50.00% |
| <b>4-year</b>                              |        |        |        |        |        |        |              |        |
| Aaa  | 65.11% | 1.66%  | 0.67%  | 0.31%  | 0.16%  | 0.10%  | 0.57%        | 31.42% |
| Aa   | 2.10%  | 47.90% | 3.59%  | 6.29%  | 3.89%  | 1.80%  | 4.19%        | 30.24% |
| A  | 1.34%  | 2.18%  | 61.93% | 4.93%  | 1.41%  | 0.99%  | 2.39%        | 24.84% |
| Baa  | 1.90%  | 0.95%  | 1.90%  | 51.42% | 3.32%  | 2.61%  | 9.95%        | 27.96% |
| Ba   | 0.00%  | 0.00%  | 0.78%  | 0.78%  | 44.96% | 3.88%  | 22.48%       | 27.13% |
| B  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 33.33% | 38.89%       | 27.78% |
| Caa or below                               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 50.00%       | 50.00% |
| <b>5-year</b>                              |        |        |        |        |        |        |              |        |
| Aaa  | 44.28% | 0.80%  | 0.51%  | 0.51%  | 0.34%  | 0.17%  | 0.57%        | 52.80% |
| Aa   | 0.35%  | 33.57% | 4.24%  | 5.65%  | 2.12%  | 3.89%  | 5.65%        | 44.52% |
| A  | 1.04%  | 0.88%  | 49.84% | 2.09%  | 1.61%  | 0.80%  | 2.97%        | 40.77% |
| Baa  | 0.57%  | 0.29%  | 0.57%  | 37.82% | 1.72%  | 2.58%  | 10.32%       | 46.13% |
| Ba   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 26.74% | 4.65%  | 32.56%       | 36.05% |
| B  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 25.00% | 37.50%       | 37.50% |
| Caa or below                               |        |        |        |        |        |        |              |        |
| <b>For WR ratings in the 5-year cohort</b> |        |        |        |        |        |        |              |        |
| <b>Rating before WR</b>                    |        |        |        |        |        |        |              |        |
| Aaa  | 96.10% | 2.49%  | 0.22%  | 0.22%  | 0.11%  | 0.00%  | 0.87%        | 0.00%  |
| Aa   | 8.73%  | 76.19% | 6.35%  | 2.38%  | 0.00%  | 0.00%  | 6.35%        | 0.00%  |
| A  | 7.28%  | 5.31%  | 82.68% | 3.15%  | 0.20%  | 0.39%  | 0.98%        | 0.00%  |
| Baa  | 14.91% | 3.11%  | 4.35%  | 73.91% | 0.62%  | 0.00%  | 3.11%        | 0.00%  |
| Ba   | 0.00%  | 0.00%  | 3.23%  | 0.00%  | 87.10% | 0.00%  | 9.68%        | 0.00%  |
| B  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 50.00% | 50.00%       | 0.00%  |
| Caa or below                               |        |        |        |        |        |        |              |        |

**Figure 72 - US CDO Rating Transition Matrices by Original Rating (1990-2006)**

| 1-year                                     | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR      |
|--|--------|--------|--------|--------|--------|--------|--------------|---------|
| Aaa  | 98.42% | 0.70%  | 0.09%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        | 0.79%   |
| Aa   | 0.00%  | 98.66% | 0.56%  | 0.22%  | 0.00%  | 0.00%  | 0.00%        | 0.56%   |
| A  | 0.00%  | 0.00%  | 97.82% | 1.20%  | 0.33%  | 0.00%  | 0.00%        | 0.66%   |
| Baa  | 0.00%  | 0.00%  | 0.09%  | 97.73% | 1.13%  | 0.35%  | 0.00%        | 0.70%   |
| Ba   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 97.69% | 0.38%  | 0.77%        | 1.15%   |
| B  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 94.12% | 2.35%        | 3.53%   |
| Caa or below                               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 50.00%       | 50.00%  |
| <b>2-year</b>                              |        |        |        |        |        |        |              |         |
| Aaa  | 94.35% | 1.29%  | 0.35%  | 0.35%  | 0.00%  | 0.00%  | 0.00%        | 3.65%   |
| Aa   | 0.32%  | 92.97% | 2.24%  | 0.96%  | 0.32%  | 0.16%  | 0.00%        | 3.04%   |
| A  | 0.00%  | 0.46%  | 92.04% | 3.22%  | 0.61%  | 0.46%  | 0.31%        | 2.91%   |
| Baa  | 0.00%  | 0.23%  | 0.34%  | 91.27% | 3.51%  | 0.79%  | 1.36%        | 2.49%   |
| Ba   | 0.00%  | 0.00%  | 0.00%  | 0.24%  | 91.44% | 2.44%  | 3.18%        | 2.69%   |
| B  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 85.00% | 8.75%        | 6.25%   |
| Caa or below                               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 50.00%       | 50.00%  |
| <b>3-year</b>                              |        |        |        |        |        |        |              |         |
| Aaa  | 85.28% | 4.91%  | 0.77%  | 0.92%  | 0.15%  | 0.00%  | 0.00%        | 7.98%   |
| Aa   | 1.63%  | 78.46% | 8.13%  | 4.07%  | 1.22%  | 0.41%  | 0.00%        | 6.10%   |
| A  | 0.83%  | 1.66%  | 78.26% | 4.76%  | 2.90%  | 1.24%  | 1.24%        | 9.11%   |
| Baa  | 0.00%  | 0.42%  | 0.85%  | 73.94% | 6.94%  | 4.67%  | 6.66%        | 6.52%   |
| Ba   | 0.00%  | 0.00%  | 0.00%  | 1.15%  | 72.62% | 7.78%  | 13.83%       | 4.61%   |
| B  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 58.67% | 30.67%       | 10.67%  |
| Caa or below                               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        | 100.00% |
| <b>4-year</b>                              |        |        |        |        |        |        |              |         |
| Aaa  | 69.83% | 8.51%  | 4.84%  | 1.16%  | 0.77%  | 0.39%  | 0.00%        | 14.51%  |
| Aa   | 0.53%  | 62.17% | 9.79%  | 8.73%  | 4.23%  | 2.38%  | 1.06%        | 11.11%  |
| A  | 0.28%  | 1.94%  | 58.89% | 6.11%  | 4.44%  | 1.94%  | 5.00%        | 21.39%  |
| Baa  | 0.00%  | 0.00%  | 0.69%  | 54.12% | 6.53%  | 7.04%  | 17.87%       | 13.75%  |
| Ba   | 0.00%  | 0.00%  | 0.00%  | 0.67%  | 52.19% | 8.08%  | 26.26%       | 12.79%  |
| B  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 47.30% | 40.54%       | 12.16%  |
| Caa or below                               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        | 100.00% |
| <b>5-year</b>                              |        |        |        |        |        |        |              |         |
| Aaa  | 54.31% | 8.62%  | 5.74%  | 2.35%  | 1.31%  | 1.04%  | 0.00%        | 26.63%  |
| Aa   | 1.39%  | 45.99% | 11.50% | 10.45% | 6.27%  | 3.48%  | 3.83%        | 17.07%  |
| A  | 0.00%  | 1.22%  | 44.31% | 5.69%  | 4.07%  | 3.25%  | 6.91%        | 34.55%  |
| Baa  | 0.00%  | 0.00%  | 0.00%  | 38.56% | 7.63%  | 7.63%  | 25.05%       | 21.13%  |
| Ba   | 0.00%  | 0.00%  | 0.00%  | 0.84%  | 40.59% | 5.86%  | 29.71%       | 23.01%  |
| B  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 39.44% | 50.70%       | 9.86%   |
| Caa or below                               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        | 100.00% |
| <b>For WR ratings in the 5-year cohort</b> |        |        |        |        |        |        |              |         |
| <b>Rating before WR</b>                    |        |        |        |        |        |        |              |         |
| Aaa  | 87.25% | 6.86%  | 4.90%  | 0.98%  | 0.00%  | 0.00%  | 0.00%        | 0.00%   |
| Aa   | 2.04%  | 77.55% | 8.16%  | 6.12%  | 4.08%  | 0.00%  | 2.04%        | 0.00%   |
| A  | 1.18%  | 7.06%  | 80.00% | 3.53%  | 7.06%  | 0.00%  | 1.18%        | 0.00%   |
| Baa  | 1.03%  | 1.03%  | 4.12%  | 75.26% | 7.22%  | 3.09%  | 8.25%        | 0.00%   |
| Ba   | 0.00%  | 0.00%  | 0.00%  | 5.45%  | 67.27% | 10.91% | 16.36%       | 0.00%   |
| B  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 71.43% | 28.57%       | 0.00%   |
| Caa or below                               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 100.00%      | 0.00%   |

**Figure 73 - US CDO (excl. HY CBOs) Rating Transition Matrices by Original Rating (1990-2006)**

| 1-year                                     | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR      |
|--|--------|--------|--------|--------|--------|--------|--------------|---------|
| Aaa  | 98.22% | 0.79%  | 0.10%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        | 0.89%   |
| Aa   | 0.00%  | 98.51% | 0.62%  | 0.25%  | 0.00%  | 0.00%  | 0.00%        | 0.62%   |
| A  | 0.00%  | 0.00%  | 97.67% | 1.28%  | 0.35%  | 0.00%  | 0.00%        | 0.70%   |
| Baa  | 0.00%  | 0.00%  | 0.10%  | 97.73% | 0.93%  | 0.41%  | 0.00%        | 0.83%   |
| Ba   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 97.12% | 0.48%  | 0.96%        | 1.44%   |
| B  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 91.11% | 2.22%        | 6.67%   |
| Caa or below                               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 50.00%       | 50.00%  |
| <b>2-year</b>                              |        |        |        |        |        |        |              |         |
| Aaa  | 93.96% | 1.10%  | 0.41%  | 0.27%  | 0.00%  | 0.00%  | 0.00%        | 4.26%   |
| Aa   | 0.37%  | 92.36% | 2.23%  | 0.93%  | 0.37%  | 0.19%  | 0.00%        | 3.54%   |
| A  | 0.00%  | 0.50%  | 91.67% | 3.33%  | 0.50%  | 0.50%  | 0.33%        | 3.17%   |
| Baa  | 0.00%  | 0.28%  | 0.42%  | 91.81% | 2.54%  | 0.56%  | 1.41%        | 2.97%   |
| Ba   | 0.00%  | 0.00%  | 0.00%  | 0.32%  | 92.90% | 1.61%  | 1.61%        | 3.55%   |
| B  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 82.50% | 5.00%        | 12.50%  |
| Caa or below                               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 50.00%       | 50.00%  |
| <b>3-year</b>                              |        |        |        |        |        |        |              |         |
| Aaa  | 87.01% | 2.07%  | 0.75%  | 0.19%  | 0.19%  | 0.00%  | 0.00%        | 9.79%   |
| Aa   | 1.99%  | 80.40% | 7.44%  | 1.99%  | 0.74%  | 0.25%  | 0.00%        | 7.20%   |
| A  | 0.93%  | 1.86%  | 79.58% | 4.18%  | 1.86%  | 0.93%  | 1.16%        | 9.51%   |
| Baa  | 0.00%  | 0.56%  | 1.13%  | 79.55% | 3.94%  | 2.63%  | 4.50%        | 7.69%   |
| Ba   | 0.00%  | 0.00%  | 0.00%  | 1.61%  | 81.85% | 4.84%  | 6.05%        | 5.65%   |
| B  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 74.29% | 11.43%       | 14.29%  |
| Caa or below                               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        | 100.00% |
| <b>4-year</b>                              |        |        |        |        |        |        |              |         |
| Aaa  | 72.86% | 5.53%  | 3.27%  | 0.50%  | 0.25%  | 0.25%  | 0.00%        | 17.34%  |
| Aa   | 0.69%  | 66.67% | 8.59%  | 4.81%  | 3.09%  | 2.41%  | 0.00%        | 13.75%  |
| A  | 0.32%  | 2.25%  | 61.09% | 6.11%  | 2.89%  | 1.29%  | 3.54%        | 22.51%  |
| Baa  | 0.00%  | 0.00%  | 0.97%  | 60.63% | 4.83%  | 4.35%  | 12.32%       | 16.91%  |
| Ba   | 0.00%  | 0.00%  | 0.00%  | 1.00%  | 61.69% | 4.98%  | 15.42%       | 16.92%  |
| B  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 67.65% | 14.71%       | 17.65%  |
| Caa or below                               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        | 100.00% |
| <b>5-year</b>                              |        |        |        |        |        |        |              |         |
| Aaa  | 54.68% | 5.62%  | 3.37%  | 0.75%  | 1.50%  | 0.37%  | 0.00%        | 33.71%  |
| Aa   | 1.99%  | 53.73% | 8.46%  | 4.48%  | 4.98%  | 2.49%  | 1.99%        | 21.89%  |
| A  | 0.00%  | 1.49%  | 45.54% | 5.45%  | 1.98%  | 1.49%  | 4.95%        | 39.11%  |
| Baa  | 0.00%  | 0.00%  | 0.00%  | 45.76% | 5.76%  | 5.08%  | 15.59%       | 27.80%  |
| Ba   | 0.00%  | 0.00%  | 0.00%  | 1.38%  | 49.66% | 2.07%  | 13.10%       | 33.79%  |
| B  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 65.63% | 21.88%       | 12.50%  |
| Caa or below                               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        | 100.00% |
| <b>For WR ratings in the 5-year cohort</b> |        |        |        |        |        |        |              |         |
| <b>Rating before WR</b>                    |        |        |        |        |        |        |              |         |
| Aaa  | 85.56% | 7.78%  | 5.56%  | 1.11%  | 0.00%  | 0.00%  | 0.00%        | 0.00%   |
| Aa   | 2.27%  | 77.27% | 9.09%  | 4.55%  | 4.55%  | 0.00%  | 2.27%        | 0.00%   |
| A  | 1.27%  | 7.59%  | 79.75% | 3.80%  | 6.33%  | 0.00%  | 1.27%        | 0.00%   |
| Baa  | 1.22%  | 1.22%  | 4.88%  | 70.73% | 8.54%  | 3.66%  | 9.76%        | 0.00%   |
| Ba   | 0.00%  | 0.00%  | 0.00%  | 6.12%  | 67.35% | 8.16%  | 18.37%       | 0.00%   |
| B  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 75.00% | 25.00%       | 0.00%   |
| Caa or below                               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 100.00%      | 0.00%   |

**Figure 74 - US CMBS Rating Transition Matrices by Original Rating (1987-2006)**

| 1-year                                     | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa or below | WR     |
|--|--------|--------|--------|--------|--------|--------|--------------|--------|
| Aaa  | 98.70% | 0.33%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        | 0.98%  |
| Aa   | 1.33%  | 97.22% | 0.33%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        | 1.11%  |
| A  | 0.10%  | 0.72%  | 98.46% | 0.31%  | 0.00%  | 0.00%  | 0.00%        | 0.41%  |
| Baa  | 0.00%  | 0.07%  | 0.13%  | 97.85% | 0.67%  | 0.07%  | 0.00%        | 1.21%  |
| Ba   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 99.29% | 0.35%  | 0.00%        | 0.35%  |
| B  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.14%  | 99.30% | 0.28%        | 0.28%  |
| Caa or below                               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 96.55%       | 3.45%  |
| <b>2-year</b>                              |        |        |        |        |        |        |              |        |
| Aaa  | 89.66% | 1.15%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        | 9.20%  |
| Aa   | 9.09%  | 81.68% | 0.96%  | 0.00%  | 0.00%  | 0.14%  | 0.00%        | 8.13%  |
| A  | 1.85%  | 5.54%  | 85.10% | 1.11%  | 0.12%  | 0.00%  | 0.00%        | 6.28%  |
| Baa  | 0.24%  | 0.64%  | 3.26%  | 81.46% | 2.23%  | 0.16%  | 0.08%        | 11.93% |
| Ba   | 0.00%  | 0.00%  | 0.30%  | 1.50%  | 94.61% | 1.35%  | 0.00%        | 2.25%  |
| B  | 0.17%  | 0.00%  | 0.00%  | 0.35%  | 0.69%  | 96.02% | 1.04%        | 1.73%  |
| Caa or below                               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 93.10%       | 6.90%  |
| <b>3-year</b>                              |        |        |        |        |        |        |              |        |
| Aaa  | 80.18% | 2.03%  | 0.23%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        | 17.57% |
| Aa   | 9.97%  | 70.28% | 1.22%  | 1.05%  | 0.00%  | 0.00%  | 0.00%        | 17.48% |
| A  | 2.91%  | 5.52%  | 76.07% | 1.23%  | 1.38%  | 0.15%  | 0.00%        | 12.73% |
| Baa  | 0.47%  | 1.23%  | 3.89%  | 64.77% | 2.56%  | 0.85%  | 0.19%        | 26.02% |
| Ba   | 0.00%  | 0.19%  | 0.96%  | 1.54%  | 88.44% | 3.28%  | 0.19%        | 5.39%  |
| B  | 0.22%  | 0.22%  | 0.22%  | 0.44%  | 1.09%  | 88.24% | 4.58%        | 5.01%  |
| Caa or below                               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 3.45%  | 0.00%  | 89.66%       | 6.90%  |
| <b>4-year</b>                              |        |        |        |        |        |        |              |        |
| Aaa  | 74.73% | 1.34%  | 0.27%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        | 23.66% |
| Aa   | 17.28% | 55.72% | 0.65%  | 0.43%  | 0.43%  | 0.00%  | 0.22%        | 25.27% |
| A  | 3.45%  | 12.07% | 62.26% | 2.49%  | 0.77%  | 0.00%  | 0.00%        | 18.97% |
| Baa  | 0.93%  | 1.28%  | 7.44%  | 52.91% | 3.49%  | 0.35%  | 0.00%        | 33.60% |
| Ba   | 0.24%  | 0.49%  | 0.24%  | 4.85%  | 76.21% | 7.52%  | 1.46%        | 8.98%  |
| B  | 0.00%  | 0.00%  | 0.00%  | 0.27%  | 1.90%  | 73.64% | 15.76%       | 8.42%  |
| Caa or below                               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 88.89%       | 11.11% |
| <b>5-year</b>                              |        |        |        |        |        |        |              |        |
| Aaa  | 67.43% | 1.64%  | 0.66%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        | 30.26% |
| Aa   | 18.82% | 46.24% | 0.81%  | 0.27%  | 0.54%  | 0.00%  | 0.54%        | 32.80% |
| A  | 4.46%  | 10.89% | 56.44% | 2.23%  | 1.24%  | 0.00%  | 0.00%        | 24.75% |
| Baa  | 1.70%  | 1.39%  | 7.11%  | 49.92% | 3.40%  | 0.15%  | 0.31%        | 36.01% |
| Ba   | 0.00%  | 0.69%  | 0.35%  | 2.78%  | 68.75% | 9.38%  | 2.43%        | 15.63% |
| B  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 2.22%  | 62.59% | 22.22%       | 12.96% |
| Caa or below                               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 4.17%  | 83.33%       | 12.50% |
| <b>For WR ratings in the 5-year cohort</b> |        |        |        |        |        |        |              |        |
| <b>Rating before WR</b>                    |        |        |        |        |        |        |              |        |
| Aaa  | 96.74% | 2.17%  | 1.09%  | 0.00%  | 0.00%  | 0.00%  | 0.00%        | 0.00%  |
| Aa   | 36.89% | 58.20% | 0.82%  | 2.46%  | 0.00%  | 0.82%  | 0.82%        | 0.00%  |
| A  | 19.00% | 22.00% | 49.00% | 2.00%  | 7.00%  | 0.00%  | 1.00%        | 0.00%  |
| Baa  | 8.15%  | 6.01%  | 10.30% | 60.09% | 9.01%  | 4.29%  | 2.15%        | 0.00%  |
| Ba   | 4.44%  | 6.67%  | 15.56% | 15.56% | 48.89% | 6.67%  | 2.22%        | 0.00%  |
| B  | 0.00%  | 0.00%  | 2.86%  | 20.00% | 20.00% | 45.71% | 11.43%       | 0.00%  |
| Caa or below                               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 33.33% | 0.00%  | 66.67%       | 0.00%  |

**Figure 75 - US RMBS Rating Transition Matrices by Original Rating (1984-2006)**

| 1-year                                     | Aaa    | Aa     | A      | Baa    | Ba      | B      | Caa or below | WR     |
|--|--------|--------|--------|--------|---------|--------|--------------|--------|
| Aaa  | 99.37% | 0.28%  | 0.00%  | 0.00%  | 0.00%   | 0.00%  | 0.00%        | 0.35%  |
| Aa   | 0.69%  | 97.91% | 0.78%  | 0.00%  | 0.00%   | 0.00%  | 0.00%        | 0.62%  |
| A  | 0.00%  | 0.59%  | 99.19% | 0.05%  | 0.00%   | 0.00%  | 0.00%        | 0.16%  |
| Baa  | 0.05%  | 0.00%  | 0.51%  | 99.14% | 0.00%   | 0.00%  | 0.00%        | 0.30%  |
| Ba   | 0.00%  | 0.00%  | 0.00%  | 1.02%  | 98.60%  | 0.00%  | 0.00%        | 0.38%  |
| B  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.90%   | 99.10% | 0.00%        | 0.00%  |
| Caa or below                               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%   | 0.00%  | 100.00%      | 0.00%  |
| <b>2-year</b>                              |        |        |        |        |         |        |              |        |
| Aaa  | 96.14% | 0.77%  | 0.03%  | 0.00%  | 0.00%   | 0.00%  | 0.00%        | 3.05%  |
| Aa   | 6.07%  | 89.29% | 2.56%  | 0.04%  | 0.00%   | 0.00%  | 0.00%        | 2.04%  |
| A  | 0.66%  | 8.07%  | 88.71% | 0.41%  | 0.00%   | 0.00%  | 0.00%        | 2.14%  |
| Baa  | 0.32%  | 0.39%  | 7.27%  | 89.34% | 0.08%   | 0.08%  | 0.00%        | 2.53%  |
| Ba   | 0.00%  | 0.50%  | 0.50%  | 9.30%  | 87.54%  | 0.17%  | 0.00%        | 1.99%  |
| B  | 0.00%  | 0.00%  | 0.28%  | 0.55%  | 9.39%   | 87.57% | 0.00%        | 2.21%  |
| Caa or below                               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%   | 0.00%  | 100.00%      | 0.00%  |
| <b>3-year</b>                              |        |        |        |        |         |        |              |        |
| Aaa  | 83.38% | 0.97%  | 0.16%  | 0.12%  | 0.00%   | 0.00%  | 0.00%        | 15.38% |
| Aa   | 12.09% | 75.35% | 4.45%  | 0.26%  | 0.16%   | 0.00%  | 0.00%        | 7.69%  |
| A  | 5.37%  | 14.16% | 67.24% | 1.48%  | 0.23%   | 0.00%  | 0.34%        | 11.19% |
| Baa  | 0.76%  | 3.14%  | 13.96% | 68.07% | 0.97%   | 0.54%  | 0.11%        | 12.45% |
| Ba   | 0.00%  | 0.63%  | 6.25%  | 15.83% | 66.88%  | 0.63%  | 0.83%        | 8.96%  |
| B  | 0.00%  | 0.00%  | 0.35%  | 0.70%  | 17.19%  | 69.12% | 1.05%        | 11.58% |
| Caa or below                               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%   | 0.00%  | 100.00%      | 0.00%  |
| <b>4-year</b>                              |        |        |        |        |         |        |              |        |
| Aaa  | 70.53% | 1.27%  | 0.29%  | 0.10%  | 0.10%   | 0.00%  | 0.00%        | 27.72% |
| Aa   | 18.32% | 61.39% | 5.23%  | 1.07%  | 0.36%   | 0.12%  | 0.00%        | 13.50% |
| A  | 8.66%  | 15.12% | 52.28% | 2.06%  | 0.88%   | 0.15%  | 0.59%        | 20.26% |
| Baa  | 1.77%  | 4.91%  | 12.01% | 57.71% | 1.09%   | 0.95%  | 1.77%        | 19.78% |
| Ba   | 0.00%  | 0.52%  | 9.42%  | 14.40% | 58.64%  | 0.79%  | 2.09%        | 14.14% |
| B  | 0.00%  | 0.00%  | 0.00%  | 1.44%  | 17.22%  | 60.29% | 1.91%        | 19.14% |
| Caa or below                               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 100.00% | 0.00%  | 0.00%        | 0.00%  |
| <b>5-year</b>                              |        |        |        |        |         |        |              |        |
| Aaa  | 65.81% | 1.75%  | 0.25%  | 0.19%  | 0.13%   | 0.06%  | 0.00%        | 31.81% |
| Aa   | 24.71% | 50.79% | 6.30%  | 1.37%  | 0.82%   | 0.34%  | 0.27%        | 15.40% |
| A  | 7.07%  | 15.20% | 57.17% | 2.57%  | 1.07%   | 0.21%  | 0.64%        | 16.06% |
| Baa  | 2.42%  | 3.72%  | 12.10% | 60.89% | 1.68%   | 0.56%  | 2.79%        | 15.83% |
| Ba   | 0.37%  | 0.00%  | 5.51%  | 16.18% | 66.91%  | 0.74%  | 1.84%        | 8.46%  |
| B  | 0.00%  | 0.00%  | 0.00%  | 2.27%  | 6.82%   | 72.73% | 3.79%        | 14.39% |
| Caa or below                               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 100.00% | 0.00%  | 0.00%        | 0.00%  |
| <b>For WR ratings in the 5-year cohort</b> |        |        |        |        |         |        |              |        |
| <b>Rating before WR</b>                    |        |        |        |        |         |        |              |        |
| Aaa  | 96.65% | 2.95%  | 0.39%  | 0.00%  | 0.00%   | 0.00%  | 0.00%        | 0.00%  |
| Aa   | 18.67% | 76.44% | 4.00%  | 0.44%  | 0.00%   | 0.00%  | 0.44%        | 0.00%  |
| A  | 5.33%  | 22.67% | 69.33% | 2.67%  | 0.00%   | 0.00%  | 0.00%        | 0.00%  |
| Baa  | 1.18%  | 7.06%  | 12.94% | 76.47% | 1.18%   | 1.18%  | 0.00%        | 0.00%  |
| Ba   | 0.00%  | 0.00%  | 8.70%  | 21.74% | 56.52%  | 0.00%  | 13.04%       | 0.00%  |
| B  | 0.00%  | 0.00%  | 0.00%  | 10.53% | 15.79%  | 68.42% | 5.26%        | 0.00%  |
| Caa or below                               |        |        |        |        |         |        |              |        |

## **Related Research**

### **Special Comments:**

Structured Finance Rating Transitions: 1983-2006 H1, August 2006 (98577)

Structured Finance Rating Transitions: 1983-2005, February 2006 (96533)

Structured Finance Rating Transitions: 1983-2004, February 2005 (91392)

Structured Finance Rating Transitions: 1983-2003, February 2004 (81239)

Structured Finance Rating Transitions: 1983-2002, January 2003 (77291)

European Structured Finance Rating Transitions: 1988-2005, February 2006 (96706)

The Performance of Structured Finance Ratings: Mid-Year 2006 Report, September 2006 (99034)

The Performance of Structured Finance Ratings: Full-Year 2005 Report, May 2006 (97346)

The Performance of Structured Finance Ratings: Mid-Year 2005 Report, September 2005 (94463)

Default & Loss Rates of Structured Finance Securities: 1993-2005, April 2006 (97234)

Default & Loss Rates of Structured Finance Securities: 1993-2004, July 2005 (93653)

Default & Loss Rates of U.S. CDOs: 1993-2003, March 2005 (91692)

Default & Loss Rates of Structured Finance Securities: 2004 First Half Update, January 2005 (90843)

Default & Loss Rates of Structured Finance Securities: 1993-2003, September 2004 (88692)

Deal Sponsor and Credit Risk of U.S. ABS and MBS Securities, December 2006 (100872)

The Relationship between Par Coupon Spreads and Credit Ratings in US Structured Finance, December 2005 (95494)

Structured Finance Watchlist Resolutions: 1992-2003, June 2004 (87305)

Measuring Loss-Given-Default for Structured Finance Securities: An Update, December 2006 (101284)

Measuring Loss Severity Rates of Defaulted Residential Mortgage Backed Securities: A Methodology, April 2004 (86769)

Payment Defaults and Material Impairments of U.S. Structured Finance Securities: 1993-2002, December 2003 (80247)

Guide to Moody's Default Research: December 2006 Update, December 2006 (98967)



### **Structured Finance Special Reports**

[Rating Changes in the U.S. Asset-Backed Securities Market: 2006 Fourth Quarter Update, January 18, 2007 \(SF90527\)](#)

[Rating Changes in the U.S. Residential Mortgage-Backed Securities Market: 2006 Second Half Update, January 19, 2007 \(SF90205\)](#)

[Rating Actions in the U.S. CDO Market: Year-to-Date Review - June 2006, August 2006, \(SF81718\)](#)

[2006 Review and 2007 Outlook: US ABS Issuance Projected to Remain Strong in 2007, January 24, 2007 \(SF90615\)](#)

[2006 Review and 2007 Outlook: Home Equity ABS 2006 Was Tough - Will 2007 Be Even More Challenging?, January 22, 2007 \(SF90546\)](#)

[2006 Review and 2007 Outlook: Private-Label Jumbo RMBS Steady for Now in the Face of Broader Market Uncertainty, January 23, 2007 \(SF90580\)](#)

[2006 Review and 2007 Outlook: Alternative-A RMBS Still Riding the Affordability Product Wave, January 19, 2007 \(SF90514\)](#)

[U.S. CMBS and CRE CDO 3Q 2006 Review: The Double-A Environment - Ambivalence and Anxiety, October, 31, 2006 \(SF85691\)](#)

[Third Quarter 2006 U.S. CDO Review: Onward and Upward, November 14, 2006 \(SF86886\)](#)

[2006 Review and 2007 Outlook: Latin American ABS/MBS Domestic Markets' Issuance Continues To Grow, January 19, 2007 \(SF90204\)](#)

*To access any of these reports, click on the entry above. Note that these references are current as of the date of publication of this report and that more recent reports may be available. All research may not be available to all clients.*

PAGE INTENTIONALLY LEFT BLANK

PAGE INTENTIONALLY LEFT BLANK

To order reprints of this report (100 copies minimum), please call 1.212.553.1658.  
Report Number: 101833

**Author**

Julia Tung

**Production Associate**

Shubhra Bhatnagar

© Copyright 2007, Moody's Investors Service, Inc. and/or its licensors and affiliates including Moody's Assurance Company, Inc. (together, "MOODY'S"). All rights reserved. **ALL INFORMATION CONTAINED HEREIN IS PROTECTED BY COPYRIGHT LAW AND NONE OF SUCH INFORMATION MAY BE COPIED OR OTHERWISE REPRODUCED, REPACKAGED, FURTHER TRANSMITTED, TRANSFERRED, DISSEMINATED, REDISTRIBUTED OR RESOLD, OR STORED FOR SUBSEQUENT USE FOR ANY SUCH PURPOSE, IN WHOLE OR IN PART, IN ANY FORM OR MANNER OR BY ANY MEANS WHATSOEVER, BY ANY PERSON WITHOUT MOODY'S PRIOR WRITTEN CONSENT.** All information contained herein is obtained by MOODY'S from sources believed by it to be accurate and reliable. Because of the possibility of human or mechanical error as well as other factors, however, such information is provided "as is" without warranty of any kind and MOODY'S, in particular, makes no representation or warranty, express or implied, as to the accuracy, timeliness, completeness, merchantability or fitness for any particular purpose of any such information. Under no circumstances shall MOODY'S have any liability to any person or entity for (a) any loss or damage in whole or in part caused by, resulting from, or relating to, any error (negligent or otherwise) or other circumstance or contingency within or outside the control of MOODY'S or any of its directors, officers, employees or agents in connection with the procurement, collection, compilation, analysis, interpretation, communication, publication or delivery of any such information, or (b) any direct, indirect, special, consequential, compensatory or incidental damages whatsoever (including without limitation, lost profits), even if MOODY'S is advised in advance of the possibility of such damages, resulting from the use of or inability to use, any such information. The credit ratings and financial reporting analysis observations, if any, constituting part of the information contained herein are, and must be construed solely as, statements of opinion and not statements of fact or recommendations to purchase, sell or hold any securities. **NO WARRANTY, EXPRESS OR IMPLIED, AS TO THE ACCURACY, TIMELINESS, COMPLETENESS, MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OF ANY SUCH RATING OR OTHER OPINION OR INFORMATION IS GIVEN OR MADE BY MOODY'S IN ANY FORM OR MANNER WHATSOEVER.** Each rating or other opinion must be weighed solely as one factor in any investment decision made by or on behalf of any user of the information contained herein, and each such user must accordingly make its own study and evaluation of each security and of each issuer and guarantor of, and each provider of credit support for, each security that it may consider purchasing, holding or selling.

MOODY'S hereby discloses that most issuers of debt securities (including corporate and municipal bonds, debentures, notes and commercial paper) and preferred stock rated by MOODY'S have, prior to assignment of any rating, agreed to pay to MOODY'S for appraisal and rating services rendered by it fees ranging from \$1,500 to \$2,400,000. Moody's Corporation (MCO) and its wholly-owned credit rating agency subsidiary, Moody's Investors Service (MIS), also maintain policies and procedures to address the independence of MIS's ratings and rating processes. Information regarding certain affiliations that may exist between directors of MCO and rated entities, and between entities who hold ratings from MIS and have also publicly reported to the SEC an ownership interest in MCO of more than 5%, is posted annually on Moody's website at [www.moody.com](http://www.moody.com) under the heading "Shareholder Relations — Corporate Governance — Director and Shareholder Affiliation Policy."

This credit rating opinion has been prepared without taking into account any of your objectives, financial situation or needs. You should, before acting on the opinion, consider the appropriateness of the opinion having regard to your own objectives, financial situation and needs.



February 2008

# Structured Finance Rating Transitions: 1983-2007

This is Moody's sixth annual global structured finance rating transitions study. We review the 2007 and historical transition rates both on an aggregate basis and within key asset classes and provide comparisons to the corporate rating transition experience.

## Key Findings

The 12-month downgrade rate for the global structured finance market climbed to a historical high of 7.4% in 2007 from 1.2% in 2006, while the upgrade rate decreased from 3.6% to 2.2%. Overall, 8725 ratings from 2116 deals were downgraded and 1954 ratings from 732 deals were upgraded.

The average number of notches lowered over the year per downgraded security also increased dramatically from 2.9 notches in 2006 to 5.8 notches in 2007; meanwhile, the average magnitude of upgrades fell from 2.6 notches to 2.3 notches.

Frequencies of transitions to Caa and below increased from the previous year and were higher than their historical averages for almost all rating categories.

The large numbers of downgrades in 2007 were primarily driven by the poor performance of recent vintage US mortgage-backed securities backed by subprime and Alt-A loans and structured finance CDOs with exposures to these securities. The 12-month downgrade rate for US HEL (including subprime securities), US RMBS (including Alt-A securities), and US CDOs in 2007 rose to 18.1%, 4.7%, and 8.4%, respectively.

US CMBS performed better than the overall structured finance market in 2007, continuing to experience many more positive than negative credit migrations. The upgrade rate for the sector was 10.2% in 2007 versus a downgrade rate of 0.8%, producing an upgrade-to-downgrade ratio of nearly 13 to 1.

## Table of Contents:

|  |    |
|--|----|
| Key Findings   | 1  |
| An Overview of Rating Transitions in 2007            | 3  |
| Sector Specific Analysis of Rating Transitions       | 12 |
| Regional Comparisons of Rating Transitions           | 31 |
| Rating Transitions in the Derivatives Sector         | 37 |
| Appendix I: Description of Data Sample and Glossary  | 39 |
| Appendix II: Methodology                             | 43 |
| Appendix III: Multi-Year Horizon Transition Matrices | 44 |
| Related Research                                     | 73 |

## Analyst Contacts:

**New York**                    **1.212.553.1653**

**Julia Tung**

*Vice President – Senior Credit Officer*

**Richard Cantor**

*Team Managing Director*

**Nicolas Weill**

*Group Managing Director*

**London**                    **44.20.7772.5454**

**David Rosa**

*Vice President – Senior Credit Officer*



**Moody's Investors Service**

**Exhibit 1: Global Structured Finance 12-Month Downgrade and Upgrade Rates by Sector in 2007, 2006, and Averaged over 1998-2007<sup>1</sup>**

|                                  | 12-month Downgrade Rate |      |           | 12-month Upgrade Rate |       |           |
|----------------------------------|-------------------------|------|-----------|-----------------------|-------|-----------|
|                                  | 2007                    | 2006 | 1998-2007 | 2007                  | 2006  | 1998-2007 |
| US ABS ex HEL                    | 0.4%                    | 1.3% | 4.8%      | 2.5%                  | 2.7%  | 1.6%      |
| US Autos                         | 0.0%                    | 0.0% | 0.4%      | 9.2%                  | 14.1% | 4.5%      |
| US Credit Cards                  | 0.0%                    | 0.1% | 0.7%      | 7.5%                  | 3.5%  | 2.7%      |
| US Student Loans                 | 0.1%                    | 0.0% | 0.0%      | 0.7%                  | 0.4%  | 0.9%      |
| US Equipment Lease               | 1.3%                    | 0.0% | 4.6%      | 4.2%                  | 7.2%  | 2.1%      |
| US HEL (includes subprime)       | 18.1%                   | 1.7% | 3.0%      | 1.0%                  | 1.5%  | 0.9%      |
| US RMBS (includes Alt-A)         | 4.7%                    | 0.2% | 0.4%      | 0.7%                  | 1.6%  | 2.0%      |
| US CMBS                          | 0.8%                    | 1.6% | 2.6%      | 10.2%                 | 16.6% | 9.9%      |
| US CDOs                          | 8.4%                    | 2.6% | 6.6%      | 1.3%                  | 3.2%  | 1.5%      |
| US HY CBOs                       | 2.7%                    | 5.9% | 15.9%     | 3.8%                  | 12.4% | 2.9%      |
| US HY CLOs                       | 0.2%                    | 0.7% | 1.6%      | 0.7%                  | 2.3%  | 1.1%      |
| US SF CDOs                       | 20.1%                   | 3.2% | 6.6%      | 1.3%                  | 2.3%  | 1.6%      |
| US Synthetic Arbitrage CDOs      | 1.1%                    | 4.3% | 5.5%      | 0.4%                  | 0.8%  | 0.5%      |
| US Structured Finance            | 8.1%                    | 1.2% | 2.6%      | 2.0%                  | 3.5%  | 2.5%      |
| EMEA Structured Finance          | 2.7%                    | 1.2% | 2.4%      | 3.0%                  | 3.2%  | 3.1%      |
| Asia Pacific Structured Finance  | 0.9%                    | 0.8% | 0.8%      | 4.5%                  | 5.6%  | 4.2%      |
| Latin America Structured Finance | 0.8%                    | 3.2% | 7.5%      | 10.6%                 | 21.0% | 6.0%      |
| Global Structured Finance        | 7.4%                    | 1.2% | 2.6%      | 2.2%                  | 3.6%  | 2.6%      |
| Global Corporate                 | 8.7%                    | 9.5% | 13.8%     | 18.7%                 | 13.0% | 11.1%     |

US ABS, excluding HEL, also performed well in 2007. The downgrade rate for this sector dropped to an extremely low 0.4%, while the upgrade rate dipped to 2.5%. Upgrades were concentrated in transactions backed by auto loans and credit card receivables, with student loan ABS also contributing to positive rating actions for the year.

The number of structured finance upgrades in 2007 also greatly exceeded the number of downgrades for the Asia-Pacific region and Latin America. However, while the EMEA structured finance market avoided the large numbers of negative rating actions that occurred in the US, European CDOs and structured investment vehicles (SIVs) were also negatively impacted by the US housing market recession and general market volatility. As a result the EMEA downgrade rate also increased from 1.2% in 2006 to 2.7% in 2007.

<sup>1</sup> For a definition of terms used in the report please see the glossary in the Appendix.

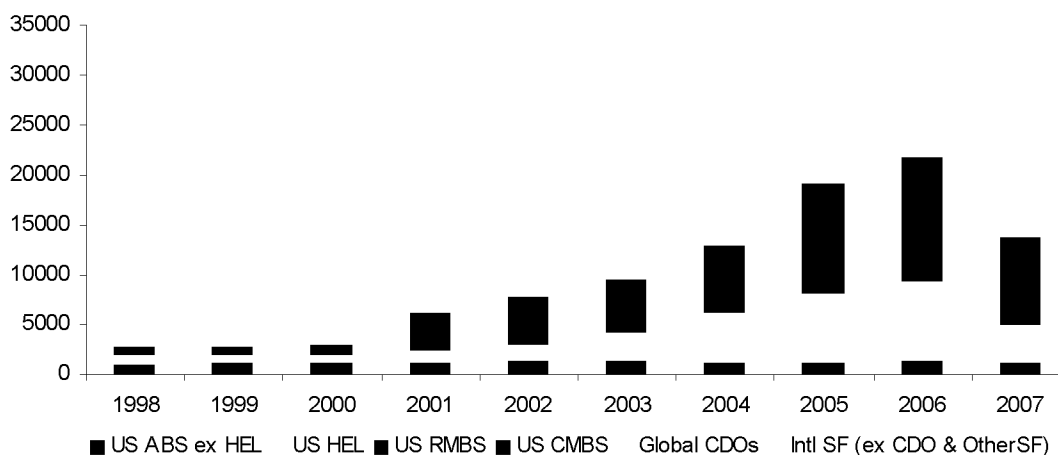
## An Overview of Rating Transitions in 2007

2007 marked the most tumultuous year experienced to date by the global structured finance market. Due to the woes of the US residential housing market, particularly for subprime borrowers, the performance of recent vintage securities backed by subprime and Alt-A mortgages deteriorated rapidly, leading to waves of downgrades. This in turn caused multiple negative rating actions to be taken against recently securitized CDOs with exposures to these downgraded mortgage-backed securities. The subsequent decline in the market value of structured finance securities and stressful conditions in the market in general had a devastating effect on transactions exposed to liquidity and market price volatility, such as structured investment vehicles and market-value CDOs. The result of all of this was that the 12-month downgrade rate soared to an unprecedented high in 2007. ABS, excluding subprime securities, CMBS, and RMBS backed by prime mortgages continued to perform well, but the good news was mostly overwhelmed by the bad.

In this section we discuss rating transitions for the global structured finance market, excluding derivative securities such as structured notes and repackaged securities. Detailed rating transitions data for the major sectors in the US (ABS excluding HEL, HEL, RMBS, CMBS, and CDOs) and the other structured finance category are presented later in the report. Rating transitions in EMEA (Europe, the Middle East, and Africa), the Asia-Pacific region and Latin America, as well as the global derivatives sector, are also analyzed later in the report.<sup>2</sup> Multi-year horizon transition matrices can be found in the Appendix. Note that the criteria used to create the data set for this report has changed from prior years. The most notable changes are that pari-passu tranches are no longer collapsed and wrapped tranches are included. In addition, the rating immediately prior to withdrawal is now used to count downgrades and upgrades. For a more detailed description of the data sample and calculation methods, please see the Appendix.

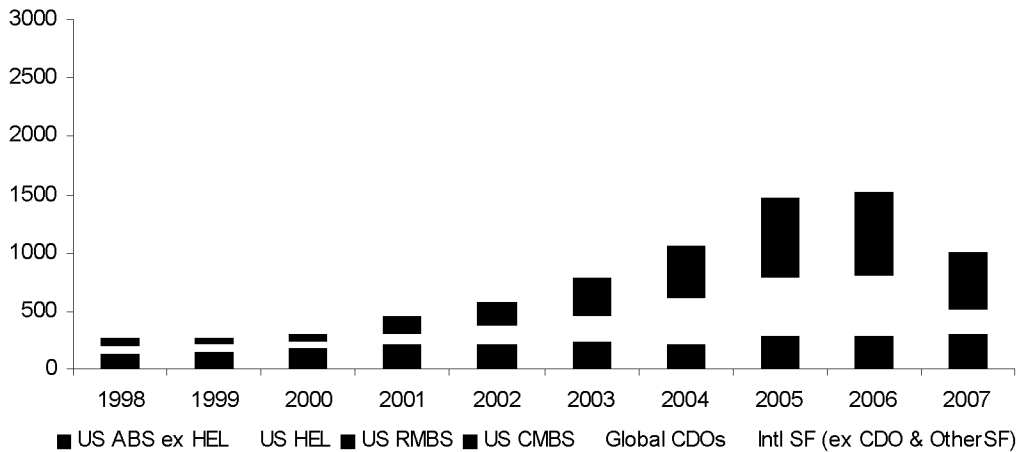
After experiencing continuous strong growth since 1998, structured finance issuance was down both by numbers of ratings and by volume in 2007 (Exhibits 2A and 2B). The most severe contraction was seen among US mortgage-backed securities. US HEL issuance (including subprime securities) dropped roughly 58% by volume and 55% by count, while US RMBS issuance (including Alt-A securities) decreased about 45% by volume and 31% by count. Issuance of CDOs, globally, fell approximately 17% by volume and 15% by count. The only sector that continued to experience strong growth was the international structured finance market, excluding CDOs and other structured finance, on a volume basis.

**Exhibit 2A: Structured Finance Issuance by Rating Count per Year**



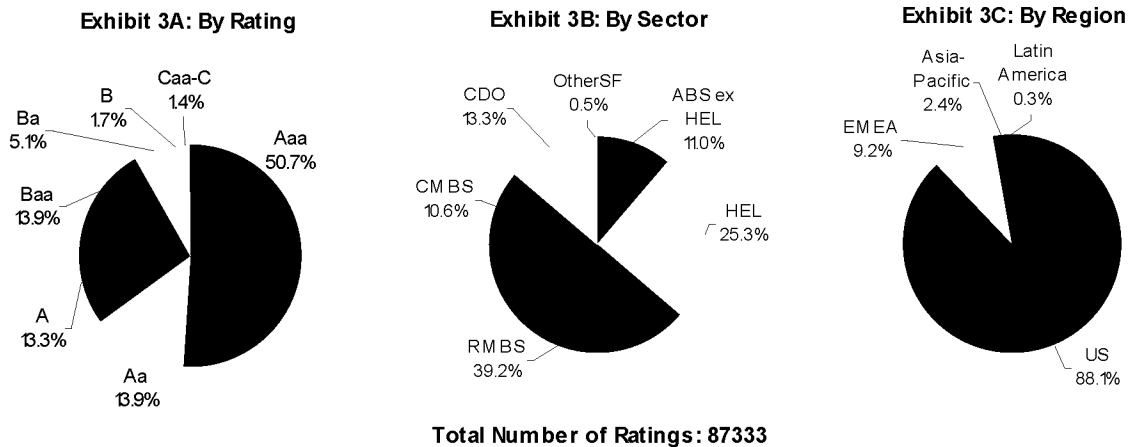
<sup>2</sup> Moody's also publishes separate rating transition studies for EMEA, Japan, and the Asia Pacific region ex-Japan (forthcoming).

**Exhibit 2B: Structured Finance Issuance Volume (US\$ billions) per Year**



At the beginning of 2007, there were 87,333 global structured finance ratings outstanding from 23,740 deals. More than half the securities outstanding at the beginning of the year were Aaa-rated, with the rest of the investment-grade rating categories taking roughly equal shares of around 14% each (Exhibit 3A). The residential mortgage-backed securities sectors remained the largest with RMBS taking the biggest share (39%), followed by HEL (25%), CDOs (13%), ABS excluding HEL (11%), CMBS (11%), and the other structured finance category (0.5%) (Exhibit 3B). Structured finance ratings were still heavily concentrated in the US<sup>3</sup>, which accounted for 88% of outstanding ratings (Exhibit 3C).

**Exhibit 3: Distribution of Outstanding Ratings on 1/1/2007**

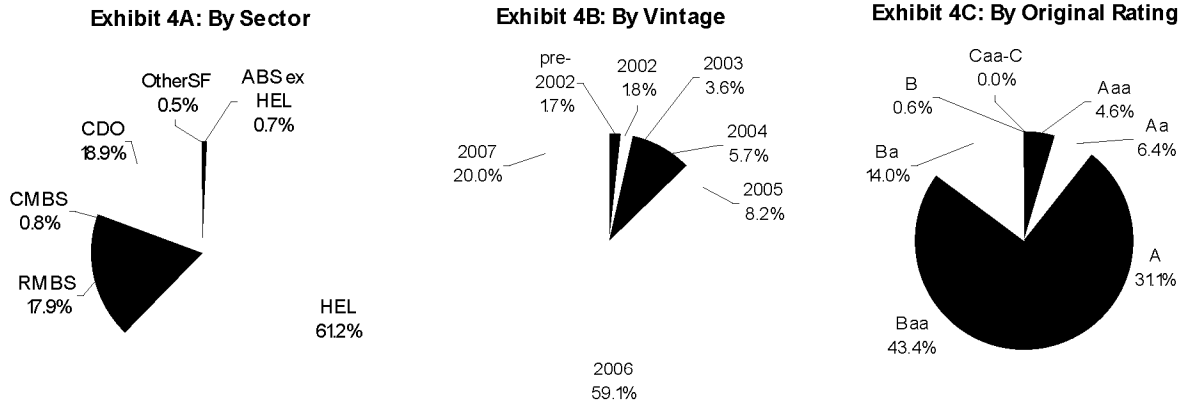


Over the course of 2007, 8725 ratings from 2116 deals were downgraded and 1954 ratings from 732 deals were upgraded in the global structured finance market. Downgrades were heavily skewed to a few specific sectors, vintages, and rating categories. 98% of the downgrades occurred in the HEL (61%), CDO (19%), and RMBS (18%) sectors (Exhibit 4A). Securities issued in 2006 (59%) and 2007 (20%) accounted for almost 80% of downgrade activity (Exhibit 4B), while close to 75% of the downgrades occurred among securities originally rated single-A or Baa (Exhibit 4C). As discussed later, the bulk of the downgrades in 2007 involved poorly performing subprime, Alt-A, and SF CDO securities from the 2006 and 2007 vintages.

<sup>3</sup> Canadian structured finance securities are included in the US total. There were 253 Canadian structured finance ratings outstanding as of 1/1/2007, representing only 0.33% of the US total.



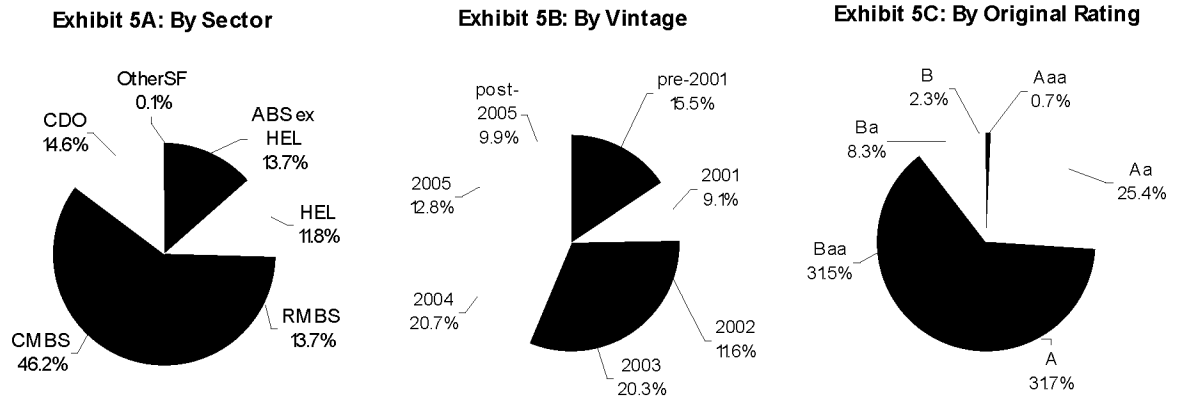
**Exhibit 4: Distribution of Downgrades in 2007**



**Total Number of Downgrades: 8725**

As in 2005 and 2006, upgrades for the year were concentrated in the CMBS sector, the source of 46% of all upgrade activity in 2007 (Exhibit 5A). Unlike downgrades during the year, aside from CMBS, upgrades were more evenly split between the other major sectors of structured finance and were also more uniformly distributed by vintage (Exhibit 5B). Securities originally rated Baa and single-A were upgraded the most, but Aa-rated securities also accounted for a significant share of upgrade activity (Exhibit 5C). Similar to the past, upgrades were mostly caused by increased support from amortization and/or strong collateral performance.

**Exhibit 5: Distribution of Upgrades in 2007**



**Total Number of Upgrades: 1954**

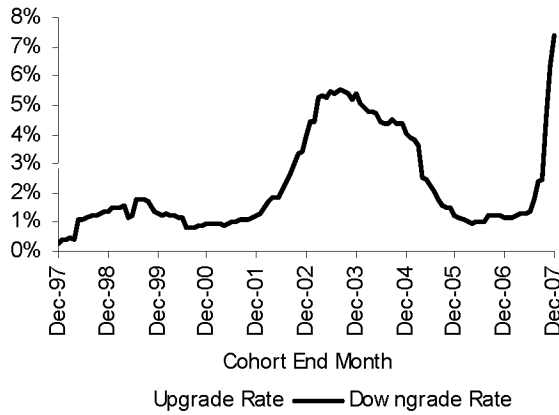
**Analysis of Rating Transition Trends**

The 12-month downgrade climbed from 1.2% in 2006 to a historical high of 7.4% in 2007, while the 12-month upgrade rate declined to 2.2% from 3.6% (Exhibits 6A and 6E). The average magnitude of rating downgrades, measured as the average number of notches changed in the course of a 12-month period per downgraded security, also made a dramatic increase of almost 3 notches from 2.9 in 2006 to 5.8 in 2007 (Exhibit 6B). Meanwhile, the average magnitude of upgrades dipped to 2.3 notches from 2.6.

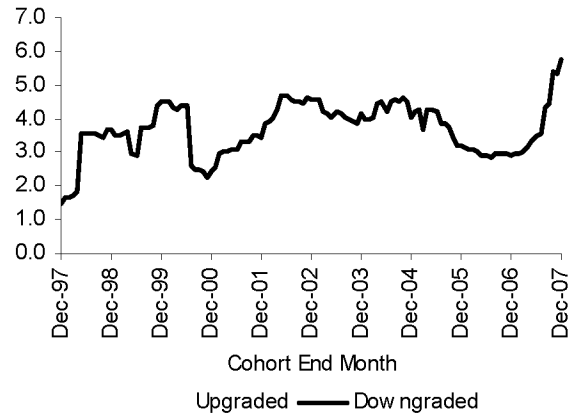
The fallen angel rate, defined as the frequency of which investment-grade rated securities are downgraded to non-investment grade ratings over a 12-month period, mimicked the overall downgrade rate, also hitting a record-breaking high of 4.4% in 2007 (Exhibit 6C). The frequency of Aaa downgrades was still low on an absolute basis, but also increased sharply from its year-prior level.

### Exhibit 6: Global Structured Finance Rating Transition Trends

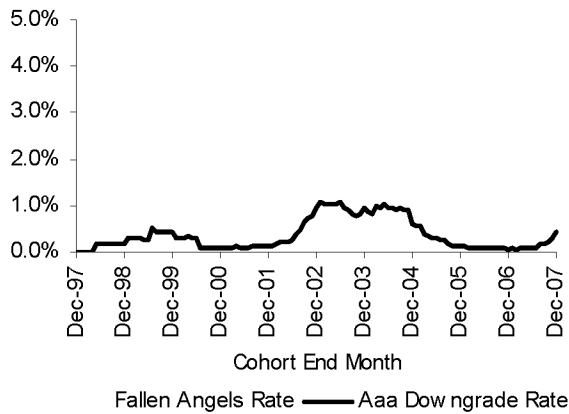
**Exhibit 6A: Upgrade and Downgrade Rates**



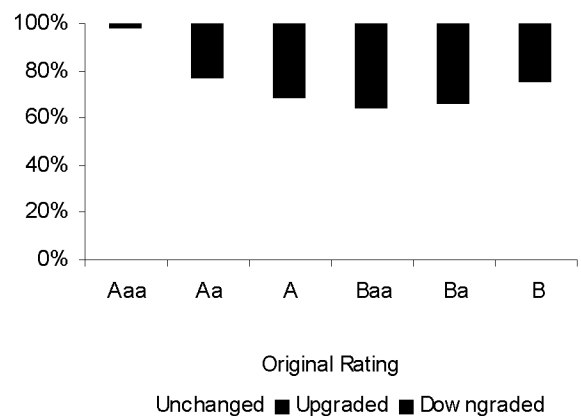
**Exhibit 6B: Average Number of Notches Upgraded or Downgraded**



**Exhibit 6C: Fallen Angel Rates and Aaa Downgrade Rates**



**Exhibit 6D: Cumulative Upgrade and Downgrade Rates by Original Rating**



**Exhibit 6E: Summary of Rating Transition Trends**

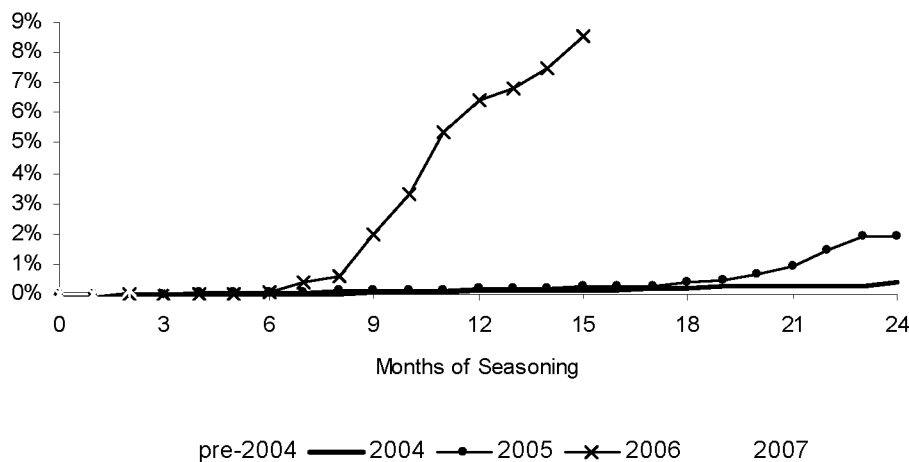
|  | 2007    | 2006   | 1998-2007 | 1998-2006 |
|--|---------|--------|-----------|-----------|
| Downgrade Rate                           | 7.40%   | 1.18%  | 2.56%     | 2.47%     |
| Upgrade Rate                             | 2.21%   | 3.60%  | 2.57%     | 2.44%     |
| Downgrade/Upgrade Ratio                  | 3.35    | 0.33   | 1.00      | 1.01      |
| Downgrade Rate (Notch Weighted)          | 42.63%  | 3.44%  | 10.76%    | 9.86%     |
| Upgrade Rate (Notch Weighted)            | 5.03%   | 9.44%  | 6.41%     | 6.11%     |
| Downgrade/Upgrade Ratio (Notch Weighted) | 8.47    | 0.36   | 1.68      | 1.61      |
| Rating Drift (Notch Weighted)            | -37.59% | 6.00%  | -4.35%    | -3.74%    |
| Rating Volatility (Notch Weighted)       | 47.66%  | 12.88% | 17.17%    | 15.97%    |
| Stability Rate                           | 90.39%  | 95.22% | 94.87%    | 95.09%    |
| Average Number of Notches Downgraded     | 5.76    | 2.92   | 4.20      | 3.99      |
| Average Number of Notches Upgraded       | 2.28    | 2.62   | 2.50      | 2.51      |

Exhibit 6D shows the cumulative transition rates of securities issued between 1983 to 2007 by comparing the original rating of the tranche to its rating as of 12/31/07 or just prior to withdrawal if the rating had been withdrawn by the end of 2007. In spite of the amount of negative rating activity this year, on average, Aaa ratings are still very stable, experiencing only a 1.3% cumulative downgrade rate to date. Securities originally rated Aa have more than double the chance of being upgraded than downgraded. The lower rating categories have fared less well, although a significant portion of the downgrades came from just the single year 2007.

Securities issued in 2007 experienced much higher downgrades rates than historically observed for securities in their first year of seasoning. This creates an inconsistency between the downgrade counts shown in Exhibit 4 and some of the downgrade statistics in Exhibit 6. Exhibit 4 counts all securities that experienced a net downgrade during 2007, regardless of when the security was issued, while the transition statistics in Exhibits 6A, 6B, and 6C only cover rating changes for ratings that were outstanding as of the beginning of the year.<sup>4</sup> For example, the 12-month downgrade rate for 2007 is calculated as a percentage of the ratings that were outstanding as of 1/1/07 that had a lower rating as of 12/31/07 or before withdrawal, if the rating was withdrawn during the year. Therefore, securities that were issued in 2007 would not be counted in this calculation. This was not a significant issue in previous years because not many securities experienced rating changes within the first year of their lives.

To put this into context, Exhibit 7 graphs the cumulative downgrade rate by seasoning of various vintage groupings. Securities issued in 2004 and 2005 experienced negligible downgrade activity in the first year of seasoning and around 1% of securities issued prior to 2004 had experienced a downgrade 12 months after closing. For securities in the 2006 vintage that had been seasoned 12 months, 6.4% had already experienced a downgrade, and for securities issued in 2007 that had reached 6 months of seasoning, almost 3% had already experienced a downgrade.

**Exhibit 7: Cumulative Downgrade Rate by Seasoning and Vintage**



### Downgrades of Aaa-rated Securities

2007 was also unusual because of the apparent vulnerability of Aaa-rated securities to downgrades. To take a closer look at this phenomenon, Exhibit 8 shows the cumulative rating migration experience to date of securities originally rated Aaa for transactions securitized prior to 2006 and deals issued in 2006 and 2007 (excluding the other structured finance category).

Downgrade rates are still low on an absolute basis, at less than 2% across all groupings. For the pre-2006 vintages, the overall Aaa downgrade rate was 1.2% by count and 0.9% by volume and the transition rate into the non-investment grade categories was 0.3% by count and volume. However, the Aaa downgrade rates for securities that closed in 2006 and 2007 have already surpassed those of the pre-2006 vintages, which is surprising given the relatively unseasoned status of those securities (17 months for 2006 and 7 months for 2007) versus the average age of the pre-2006 grouping (7.3 years).

<sup>4</sup> This is not true of Exhibit 6D which includes all securities issued between 1983 and 2007.

For the 2006 vintage, 1.3% of securities originally rated Aaa have been downgraded both by count and volume and 0.3% have been downgraded to a non-investment grade rating. Aaa-rated securities issued in 2007 have performed even worse with a 1.9% downgrade rate by count and 1.3% by volume. Transitions to below investment grade ratings are also more frequent for the 2007 vintage than for the other vintages at 0.5% by count and 0.4% by volume.

**Exhibit 8: Cumulative Rating Transitions of Securities Originally Rated Aaa as of 12/31/07**

| Pre-2006 Vintages    | Aaa        | Aa        | A        | Baa        | Ba        | B        | Caa        | Ca/C        |
|----------------------|------------|-----------|----------|------------|-----------|----------|------------|-------------|
| By Count             | 62,923     | 350       | 128      | 63         | 52        | 52       | 68         | 28          |
| % By Count           | 98.84%     | 0.55%     | 0.20%    | 0.10%      | 0.08%     | 0.08%    | 0.11%      | 0.04%       |
| By Volume (US\$ bil) | 8,113.4    | 36.9      | 9.4      | 7.2        | 7.2       | 3.2      | 11.8       | 1.7         |
| % By Volume          | 99.05%     | 0.45%     | 0.12%    | 0.09%      | 0.09%     | 0.04%    | 0.14%      | 0.02%       |
| <b>2006 Vintage</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa</b> | <b>Ca/C</b> |
| By Count             | 13,315     | 83        | 32       | 23         | 22        | 10       | 4          | 3           |
| % By Count           | 98.69%     | 0.62%     | 0.24%    | 0.17%      | 0.16%     | 0.07%    | 0.03%      | 0.02%       |
| By Volume (US\$ bil) | 2,232.6    | 12.8      | 5.2      | 4.3        | 2.7       | 3.2      | 0.5        | 0.6         |
| % By Volume          | 98.70%     | 0.57%     | 0.23%    | 0.19%      | 0.12%     | 0.14%    | 0.02%      | 0.02%       |
| <b>2007 Vintage</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa</b> | <b>Ca/C</b> |
| By Count             | 9,468      | 22        | 51       | 53         | 27        | 13       | 8          | 5           |
| % By Count           | 98.14%     | 0.23%     | 0.53%    | 0.55%      | 0.28%     | 0.13%    | 0.08%      | 0.05%       |
| By Volume (US\$ bil) | 1,946.8    | 5.4       | 6.9      | 5.6        | 3.5       | 3.0      | 0.7        | 0.5         |
| % By Volume          | 98.70%     | 0.27%     | 0.35%    | 0.28%      | 0.18%     | 0.15%    | 0.03%      | 0.03%       |

*Note: Data does not include the Other Structured Finance category.*

**Transitions to Caa and Below**

Another atypical feature of 2007 was the comparatively large proportion of downgrades into the lowest rating categories. Exhibit 9 shows the number and amount of securities downgraded to Caa and below by original rating category, again for the pre-2006 vintages, the 2006 vintage, and the 2007 vintage. By count, the overall transition rate to Caa and below is 1.9% for securities issued prior to 2006, 5.7% for securities issued in 2006, and 2.8% for securities issued in 2007 and by volume, the rate is 0.6%, 0.8%, and 0.4%, respectively.

Comparing the overall downgrade rate between these three groups may be misleading because it does not control for differences in the rating distribution by closing year. In fact, there was a higher percentage of Aaa ratings and a lower percentage of speculative grade ratings in the pre-2006 vintages than in later vintages. However, even controlling for ratings, all securities rated Ba or higher that closed in 2006 or 2007 have similar or higher migration rates to Caa and below than securities that closed in 2005 or earlier. This is true despite the fact that the average seasoning for the pre-2006 vintages is 6.7 years versus 17 months for the 2006 vintage and 7 months for the 2007 vintage.

**Exhibit 9: Cumulative Rating Transitions to Caa and Below by Original Rating as of 12/31/07**

| Pre-2006 Vintages    | Aaa        | Aa        | A        | Baa        | Ba        | B        | Total        |
|----------------------|------------|-----------|----------|------------|-----------|----------|--------------|
| By Count             | 96         | 171       | 199      | 810        | 460       | 254      | 1990         |
| Total By Count       | 63,664     | 13,015    | 12,005   | 11,803     | 3,838     | 1,455    | 105,780      |
| % By Count           | 0.2%       | 1.3%      | 1.7%     | 6.9%       | 12.0%     | 17.5%    | 1.9%         |
| By Volume (US\$ bil) | 13.6       | 7.8       | 7.2      | 17.3       | 6.7       | 2.4      | 55.0         |
| Total By Volume      | 8,190.9    | 566.4     | 405.0    | 281.2      | 49.6      | 15.1     | 9,508.2      |
| % By Volume          | 0.2%       | 1.4%      | 1.8%     | 6.2%       | 13.6%     | 15.8%    | 0.6%         |
| <b>2006 Vintage</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Total</b> |
| By Count             | 7          | 53        | 185      | 805        | 569       | 9        | 1628         |
| Total By Count       | 13,492     | 4,784     | 4,163    | 4,239      | 1,595     | 296      | 28,569       |
| % By Count           | 0.1%       | 1.1%      | 4.4%     | 19.0%      | 35.7%     | 3.0%     | 5.7%         |
| By Volume (US\$ bil) | 1.1        | 1.7       | 2.9      | 9.0        | 5.2       | 0.1      | 20.0         |
| Total By Volume      | 2,261.9    | 138.7     | 103.1    | 83.8       | 22.4      | 3.5      | 2,613.5      |
| % By Volume          | 0.0%       | 1.2%      | 2.8%     | 10.7%      | 23.3%     | 1.8%     | 0.8%         |
| <b>2007 Vintage</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Total</b> |
| By Count             | 13         | 27        | 75       | 289        | 137       | 0        | 541          |
| Total By Count       | 9,647      | 3,256     | 2,711    | 2,771      | 947       | 234      | 19,566       |
| % By Count           | 0.1%       | 0.8%      | 2.8%     | 10.4%      | 14.5%     | 0.0%     | 2.8%         |
| By Volume (US\$ bil) | 1.2        | 1.6       | 1.7      | 4.0        | 1.6       | 0.0      | 10.1         |
| Total By Volume      | 1,972.4    | 98.7      | 77.6     | 84.3       | 15.5      | 2.5      | 2,251.1      |
| % By Volume          | 0.1%       | 1.6%      | 2.2%     | 4.8%       | 10.4%     | 0.0%     | 0.4%         |

*Note: Data does not include the Other Structured Finance category.*

**Comparison to Corporate Rating Transitions**

The rating transition experience of the structured finance and corporate finance markets<sup>5</sup> diverged in 2007. While both sectors had enjoyed historically low downgrades rates in 2006, global corporate downgrade rates remained low, while that of global structured finance soared (Exhibit 10). The past experience has been that corporate ratings are much less stable than structured ratings, but when rating changes do occur, the average magnitude of the change is much lower for corporate finance than structured finance. This was still true in 2007, but the difference between the 12-month frequency of downgrades for the corporate and structured sectors shrunk considerably, while the difference in the size of rating downgrades ballooned (5.8 notches for structured versus 1.5 notches for corporate).

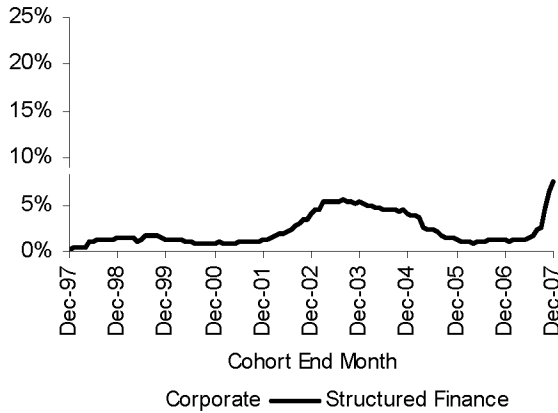
Unlike the structured finance upgrade rate which fell in 2007, the corporate upgrade rate rose considerably, but this was partially caused by corporate rating migrations due to changes in rating methodology. The magnitude of rating upgrades declined slightly in both sectors, remaining about a notch apart from each other.

Exhibit 11 compares the 12-month rating transition matrices for global structured finance and global corporate finance in 2007 and averaged over the period 1984 to 2007. For the 2007 cohort, Aaa- and Aa-rated structured finance securities were still more stable than their corporate counterparts. However, single-A, Baa, and Ba structured finance ratings experienced much higher downgrade rates than their corporate counterparts. This contrasts with the historical experience when all structured finance rating categories were more stable. With the exception of the single-B rating category, structured finance securities were also much more likely to be downgraded to Caa and below than corporate securities in 2007, which is consistent with the past.

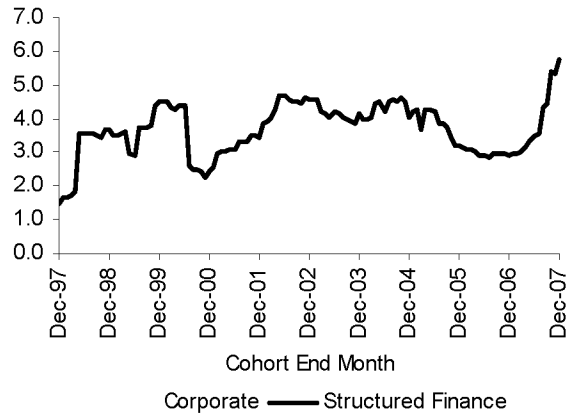
<sup>5</sup> The structured finance and corporate transition statistics presented in this section use different methodologies in treating rating withdrawals. The structured finance statistics use the rating before WR as the end rating, while the corporate statistics exclude non-defaulted withdrawn ratings from the calculation. In addition, defaults are treated as downgrades for the corporate sector.

**Exhibit 10: Comparison of Rating Transition Trends for Corporate and Structured Finance**

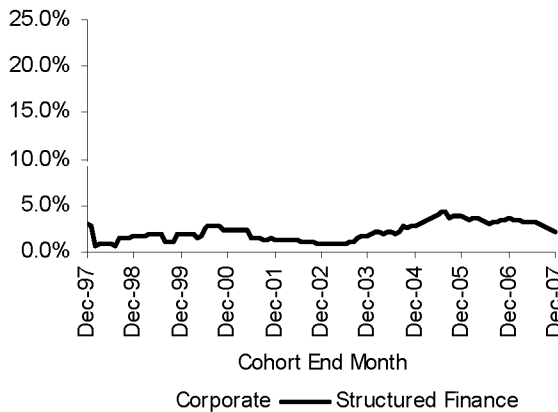
**Exhibit 10A: 12-month Downgrade Rates**



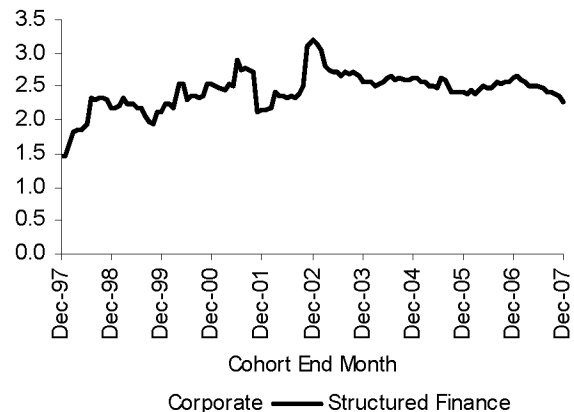
**Exhibit 10B: Average Number of Notches Downgraded**



**Exhibit 10C: 12-month Upgrade Rates**



**Exhibit 10D: Average Number of Notches Upgraded**



**Exhibit 10E: Summary of Rating Transition Trends**

|  | Structured Finance |           | Corporate Finance |           |
|--|--------------------|-----------|-------------------|-----------|
|  | 2007               | 1984-2007 | 2007              | 1984-2007 |
| Downgrade Rate                           | 7.40%              | 2.34%     | 8.72%             | 13.56%    |
| Upgrade Rate                             | 2.21%              | 2.47%     | 18.67%            | 9.86%     |
| Downgrade/Upgrade Ratio                  | 3.35               | 0.95      | 0.47              | 1.38      |
| Downgrade Rate (Notch Weighted)          | 42.63%             | 9.40%     | 13.12%            | 24.27%    |
| Upgrade Rate (Notch Weighted)            | 5.03%              | 5.88%     | 26.45%            | 14.78%    |
| Downgrade/Upgrade Ratio (Notch Weighted) | 8.47               | 1.60      | 0.50              | 1.64      |
| Rating Drift (Notch Weighted)            | -37.59%            | -3.52%    | 13.33%            | -9.49%    |
| Rating Volatility (Notch Weighted)       | 47.66%             | 15.28%    | 39.57%            | 39.05%    |
| Stability Rate                           | 90.39%             | 95.19%    | 72.61%            | 76.59%    |
| Average Number of Notches Downgraded     | 5.76               | 4.01      | 1.50              | 1.79      |
| Average Number of Notches Upgraded       | 2.28               | 2.38      | 1.42              | 1.50      |

**Exhibit 11: Global Structured Finance and Global Corporate Finance 12-month Rating Transition Matrices**

**Structured Finance in 2007**

|               | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below |
|---------------|--------|--------|--------|--------|--------|--------|---------------|
| Aaa           | 99.58% | 0.20%  | 0.07%  | 0.06%  | 0.05%  | 0.02%  | 0.02%         |
| Aa            | 3.65%  | 93.66% | 0.99%  | 0.60%  | 0.44%  | 0.21%  | 0.45%         |
| A             | 0.69%  | 3.19%  | 82.45% | 6.92%  | 3.69%  | 1.50%  | 1.56%         |
| Baa           | 0.36%  | 0.22%  | 1.96%  | 76.10% | 6.87%  | 7.28%  | 7.20%         |
| Ba            | 0.25%  | 0.09%  | 0.16%  | 1.61%  | 76.01% | 5.91%  | 15.98%        |
| B             | 0.14%  |        | 0.07%  | 0.21%  | 1.57%  | 91.66% | 6.36%         |
| Caa and below | 0.17%  |        |        | 0.17%  | 0.17%  | 0.51%  | 98.99%        |

**Structured Finance: 1984-2007 average**

|               | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below |
|---------------|--------|--------|--------|--------|--------|--------|---------------|
| Aaa           | 99.64% | 0.24%  | 0.07%  | 0.02%  | 0.01%  | 0.01%  | 0.01%         |
| Aa            | 6.17%  | 91.56% | 1.50%  | 0.44%  | 0.11%  | 0.09%  | 0.13%         |
| A             | 1.30%  | 3.73%  | 91.61% | 2.26%  | 0.62%  | 0.24%  | 0.23%         |
| Baa           | 0.44%  | 0.58%  | 2.86%  | 90.68% | 2.72%  | 1.44%  | 1.29%         |
| Ba            | 0.16%  | 0.09%  | 0.56%  | 2.96%  | 88.34% | 3.33%  | 4.56%         |
| B             | 0.06%  | 0.05%  | 0.09%  | 0.41%  | 2.29%  | 87.22% | 9.88%         |
| Caa and below | 0.03%  |        |        | 0.09%  | 0.11%  | 0.62%  | 99.15%        |

**Corporate Finance in 2007**

|               | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below |
|---------------|--------|--------|--------|--------|--------|--------|---------------|
| Aaa           | 95.88% | 4.12%  |        |        |        |        |               |
| Aa            | 4.52%  | 91.16% | 4.12%  | 0.10%  |        | 0.10%  |               |
| A             |        | 9.93%  | 87.27% | 2.62%  | 0.06%  |        | 0.12%         |
| Baa           |        | 0.19%  | 7.36%  | 88.55% | 3.63%  | 0.28%  |               |
| Ba            |        |        | 0.19%  | 8.38%  | 83.62% | 7.05%  | 0.76%         |
| B             | 0.10%  |        |        | 0.20%  | 6.30%  | 83.84% | 9.55%         |
| Caa and below |        |        |        |        |        | 15.98% | 84.02%        |

**Corporate Finance: 1984-2007 average**

|               | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below |
|---------------|--------|--------|--------|--------|--------|--------|---------------|
| Aaa           | 92.80% | 6.92%  | 0.26%  |        | 0.02%  | 0.00%  |               |
| Aa            | 1.27%  | 91.43% | 6.96%  | 0.27%  | 0.05%  | 0.02%  | 0.01%         |
| A             | 0.07%  | 2.96%  | 90.97% | 5.28%  | 0.56%  | 0.11%  | 0.04%         |
| Baa           | 0.05%  | 0.21%  | 5.38%  | 88.32% | 4.54%  | 1.00%  | 0.51%         |
| Ba            | 0.01%  | 0.06%  | 0.44%  | 6.48%  | 81.50% | 9.52%  | 1.99%         |
| B             | 0.01%  | 0.05%  | 0.19%  | 0.41%  | 6.13%  | 81.66% | 11.54%        |
| Caa and below |        | 0.03%  | 0.04%  | 0.20%  | 0.69%  | 11.19% | 87.85%        |

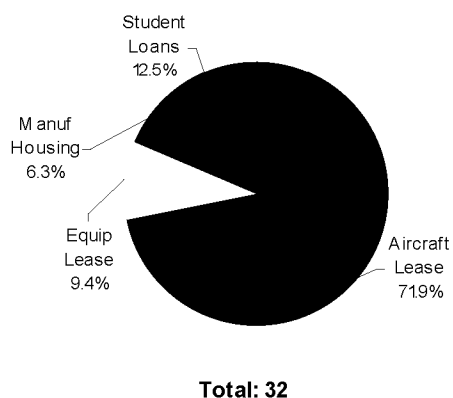
## Sector Specific Analysis of Rating Transitions

### US ABS ex HEL

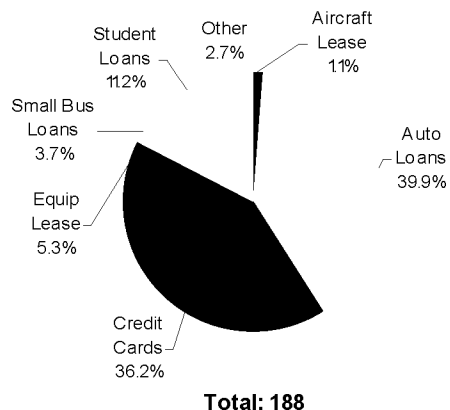
The US ABS excluding HEL sector saw a total of 32 ratings from 10 deals downgraded and 188 ratings from 135 deals upgraded in 2007. Transactions backed by aircraft leases accounted for 71.9% of the downgrades, while deals backed by auto loans (39.9%) and credit card receivables (36.2%) led upgrade activity (Exhibit 12).

**Exhibit 12: Distribution of US ABS Rating Changes in 2007**

**Exhibit 12A: Downgrades by Asset Class**



**Exhibit 12B: Upgrades by Asset Class**



The 23 aircraft lease downgrades were associated with the depletion of reserve accounts and lowered leasing revenues. All the affected tranches had been downgraded previously. The same was true of the two manufactured housing securities, which were again downgraded due to continued deterioration in collateral pool performance. Three securities backed by small-ticket equipment leases were downgraded for the first time in 2007 due to an increase in defaults and a decline in credit enhancement in the deals.

2007 marked the first time ever that the student loan sector experienced a downgrade, although the performance-related downgrades were restricted to securities backed by private student loans. While one of the four downgrades was due to structural changes in the deal, the other three were caused by higher-than-expected defaults in the underlying collateral pool.<sup>6</sup>

Auto loan securitizations experienced two large rounds of rating upgrades in 2007 for a total of 75 upgrades. The rating actions reflected a strengthening in the credit profile of the securities, based upon the actual performance of the transactions and the build up of credit enhancement relative to expected future losses in the underlying receivables pools.<sup>7</sup> The credit card sector accounted for the second largest proportion of upgrades with 68 upgrades. One of the major factors behind these upgrades was the incorporation of new aspects to Moody's approach to rating credit card transactions.<sup>8</sup> The student loan sector experienced 21 upgrades and 10 tranches backed by agricultural and industrial equipment loans/leases were upgraded due to better-than-expected performance of the underlying collateral and a build-up in the credit enhancement.

<sup>6</sup> See the related Moody's press releases, "Moody's downgrades one class of subordinate notes in the KeyCorp Student Loan Trust 2004-A securitization," December 3, 2007 and "Moody's downgrades two classes of notes in the L2L Education Loan Trust 2006-1 securitization," December 19, 2007.

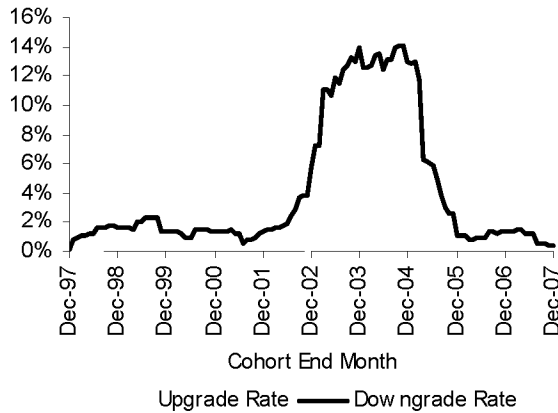
<sup>7</sup> See the related Moody's press releases, "Moody's upgrades numerous tranches from several auto loan-backed securitizations," June 4, 2007 and "Moody's upgrades 40 tranches from 26 auto loan-backed securitizations, auto indices within expectations," December 19, 2007.

<sup>8</sup> See "Moody's Approach to Rating Credit Card Receivables-Backed Securities," Moody's Rating Methodology, April 16, 2007.

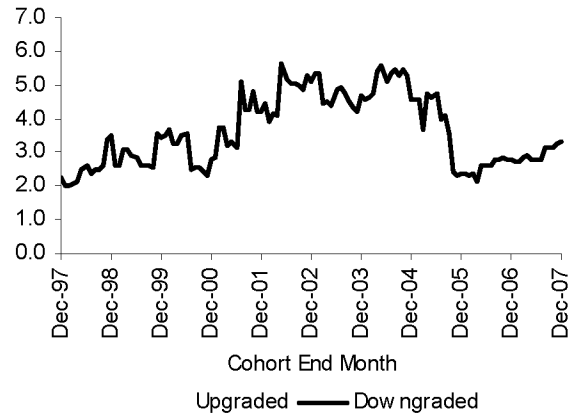


### Exhibit 13: US ABS ex HEL Rating Transition Trends

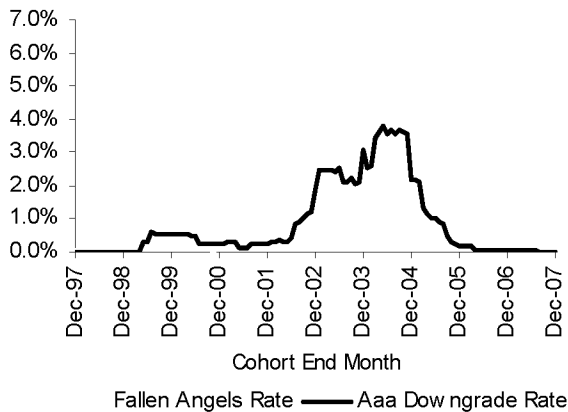
**Exhibit 13A: Upgrade and Downgrade Rates**



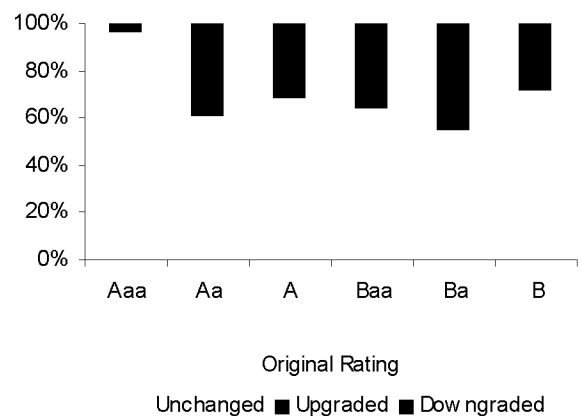
**Exhibit 13B: Average Number of Notches Upgraded or Downgraded**



**Exhibit 13C: Fallen Angel Rates and Aaa Downgrade Rates**



**Exhibit 13D: Cumulative Upgrade and Downgrade Rates by Original Rating**



**Exhibit 13E: Summary of Rating Transition Trends**

|  | 2007   | 2006   | 1998-2007 | 1998-2006 |
|--|--------|--------|-----------|-----------|
| Downgrade Rate                           | 0.42%  | 1.34%  | 4.77%     | 5.34%     |
| Upgrade Rate                             | 2.46%  | 2.66%  | 1.62%     | 1.44%     |
| Downgrade/Upgrade Ratio                  | 0.17   | 0.51   | 2.94      | 3.72      |
| Downgrade Rate (Notch Weighted)          | 1.41%  | 3.72%  | 21.61%    | 24.47%    |
| Upgrade Rate (Notch Weighted)            | 5.17%  | 6.56%  | 3.82%     | 3.53%     |
| Downgrade/Upgrade Ratio (Notch Weighted) | 0.27   | 0.57   | 5.66      | 6.93      |
| Rating Drift (Notch Weighted)            | 3.76%  | 2.84%  | -17.79%   | -20.94%   |
| Rating Volatility (Notch Weighted)       | 6.58%  | 10.28% | 25.43%    | 27.99%    |
| Stability Rate                           | 97.12% | 96.00% | 93.61%    | 93.22%    |
| Average Number of Notches Downgraded     | 3.34   | 2.77   | 4.53      | 4.58      |
| Average Number of Notches Upgraded       | 2.10   | 2.47   | 2.35      | 2.46      |

For the US ABS excluding HEL sector in 2007 (see Exhibit 13):

The frequency of downgrades declined from a low 1.3% in 2006 to an even lower 0.4% in 2007, while the upgrade rate dipped from 2.7% to 2.5%.

The average magnitude of rating downgrades rose by half a notch from 2.8 to 3.3, while the magnitude of upgrades fell by almost half a notch from 2.5 to 2.1.

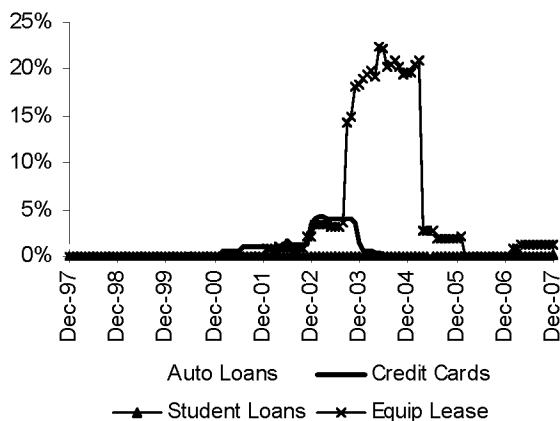
Similar to 2006, the fallen angel rate and Aaa downgrade rate hovered near zero in 2007.

Securities originally rated Aaa have also been very stable historically, but for most other rating categories, cumulative downgrade rates have exceeded cumulative upgrade rates to date.

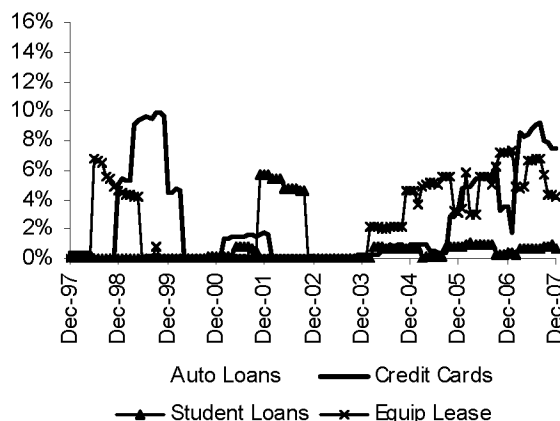
Exhibit 14 plots the 12-month downgrade and upgrades rates for the major ABS asset classes, excluding HEL. Transactions backed by auto loans, credit card receivables, and student loans have experienced minimal downgrade activity in the last 4 years and the downgrade rate has been below 5% for the last 10 years. Moody's does not foresee any meaningful near-term deterioration in the overall performance of these asset classes because of the troubles of the residential mortgage market.<sup>9</sup> The equipment lease sector experienced a spike in downgrades between 2003 and 2004, which was mostly caused by the bankruptcy of one issuer; since then, it has experienced vastly improved performance. Meanwhile, the frequency of upgrades for auto loan, credit card, and equipment lease ABS has been elevated for the past 2 years.

**Exhibit 14: 12-month Transition Rates for Select US ABS Asset Classes**

**Exhibit 14A: 12-month Downgrade Rates**



**Exhibit 14B: 12-month Upgrade Rates**



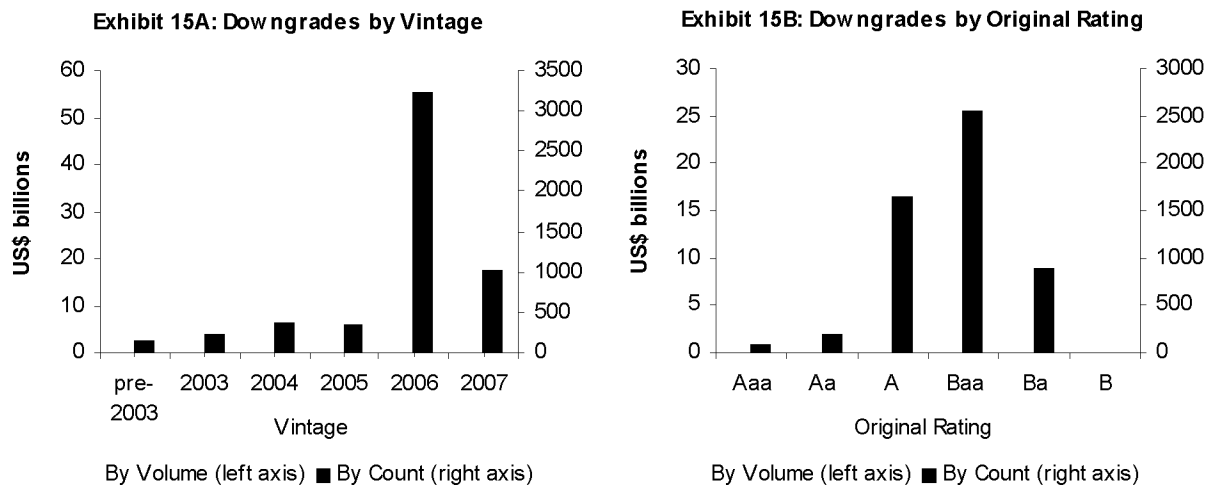
<sup>9</sup> See "FAQs Regarding the State of the U.S. Credit Card Market," *Moody's Special Report*, May 31, 2007, "Current Performance in the U.S. Auto ABS Market," *Moody's Special Report*, September 27, 2007, and "Current Performance in the U.S. Private Student Loan ABS Market Showing Little Influence from Subprime Mortgage Loans," *Moody's Special Report*, October 2, 2007.

## US HEL (includes subprime)

Perhaps no other story in 2007 garnered more attention in the press than the US subprime mortgage crisis. While many had predicted that a slowdown in the US residential housing market was imminent, most did not anticipate that the downturn would develop into the worst in the post-World War II period. The effect on the structured finance market was that a grand total of 5338 US HEL tranches from 1078 deals were downgraded in 2007 and 230 tranches from 49 deals were upgraded, producing a downgrade-to-upgrade ratio of 23 to 1.

The downgrades were concentrated in the 2006 and 2007 vintages, which accounted for 60% and 19% of the downgrades respectively by count, and 67% and 16% of the downgrades by volume (Exhibit 15A). The performance of these vintages has been characterized by high incidences of early payment defaults and much higher levels of serious delinquencies than in prior vintages, as a result of weaker mortgage credit quality and the current weak housing environment.

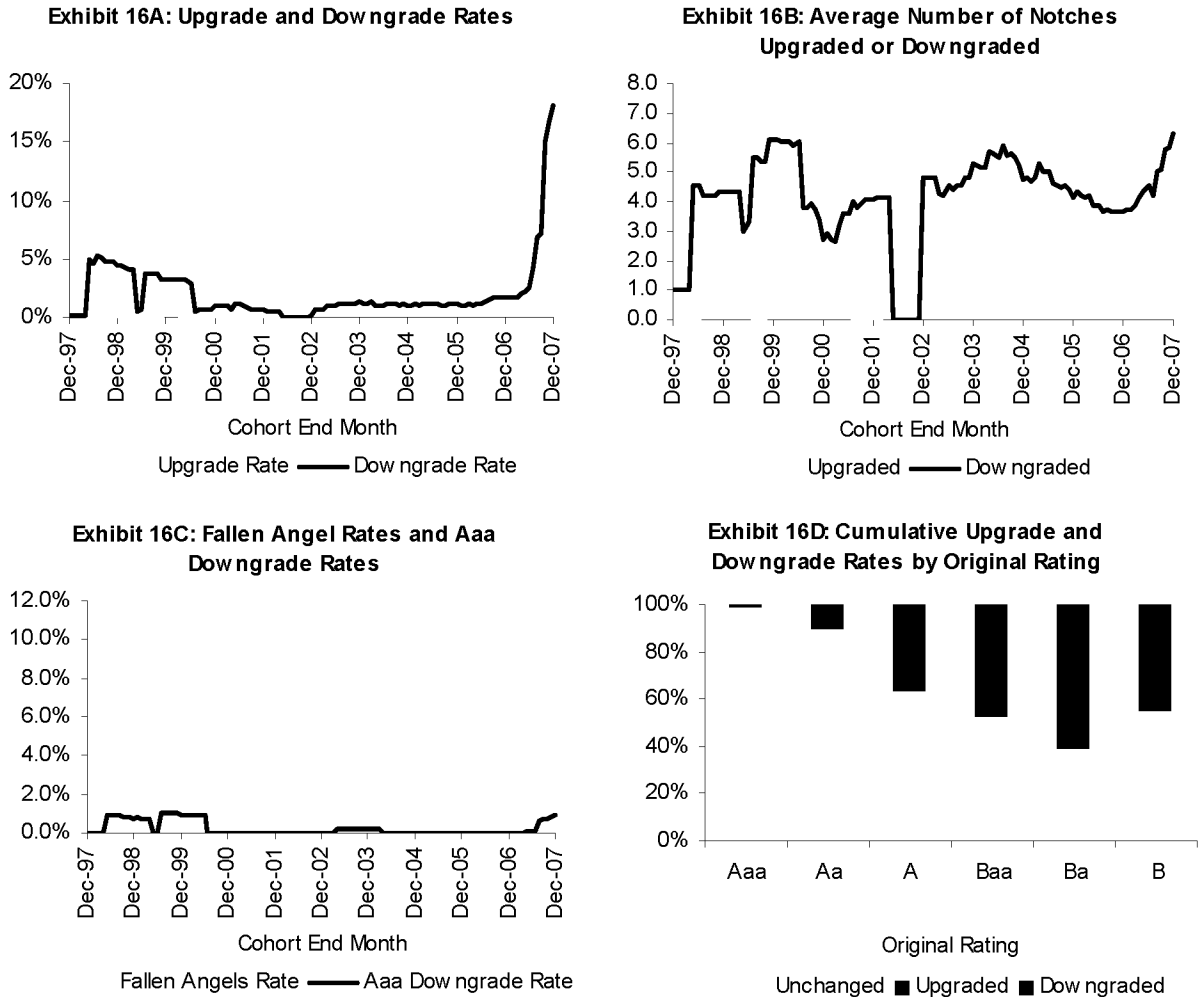
**Exhibit 15: US HEL Downgrades in 2007**



Both by count and by volume, Baa-rated securities experienced the most downgrades followed by single-A-rated securities (Exhibit 15B). In comparison, Aaa-rated and Aa-rated securities experienced much smaller numbers of rating downgrades, but the volume of Aaa downgrades was still somewhat high given the larger relative size of the senior tranches within a transaction. However, it should be noted that all US HEL securities downgraded from Aaa in 2007 were backed by subprime second-lien loans.

There was some upgrade activity for the sector in 2007, but it was limited to tranches that were originally rated investment-grade, most often high-investment grade, and issued between 2002 and 2005. Most of the positive rating actions were caused by a strong build-up in credit enhancement and/or better than anticipated loan performance.

**Exhibit 16: US HEL Rating Transition Trends**



**Exhibit 16E: Summary of Rating Transition Trends**

|  | 2007     | 2006   | 1998-2007 | 1998-2006 |
|--|----------|--------|-----------|-----------|
| Downgrade Rate                           | 18.06%   | 1.72%  | 2.97%     | 1.29%     |
| Upgrade Rate                             | 1.04%    | 1.55%  | 0.93%     | 0.73%     |
| Downgrade/Upgrade Ratio                  | 17.43    | 1.11   | 3.19      | 1.78      |
| Downgrade Rate (Notch Weighted)          | 113.80%  | 6.32%  | 15.48%    | 5.91%     |
| Upgrade Rate (Notch Weighted)            | 2.15%    | 3.90%  | 2.38%     | 1.90%     |
| Downgrade/Upgrade Ratio (Notch Weighted) | 52.85    | 1.62   | 6.51      | 3.12      |
| Rating Drift (Notch Weighted)            | -111.65% | -2.42% | -13.10%   | -4.01%    |
| Rating Volatility (Notch Weighted)       | 115.95%  | 10.23% | 17.86%    | 7.80%     |
| Stability Rate                           | 80.91%   | 96.74% | 96.09%    | 97.98%    |
| Average Number of Notches Downgraded     | 6.30     | 3.68   | 5.21      | 4.58      |
| Average Number of Notches Upgraded       | 2.08     | 2.52   | 2.55      | 2.61      |

For the US HEL sector in 2007 (see Exhibit 16)<sup>10</sup>:

The frequency of downgrades increased by a multiple of 10 from 1.7% in 2006 to 18.1% in 2007, dwarfing the frequency of upgrades, which decreased from 1.5% to 1.0%.

The average magnitude of rating downgrades rose by more than 2.5 notches to 6.3 in 2007 from 3.7 in 2006, while the magnitude of upgrades trended lower to 2.1 notches from 2.5 notches.

The fallen angel rate was 0.9% for the cohort ending December 2006 and had been below 1% for the last 6.5 years. For the cohort ending December 2007, the frequency of fallen angels rose to 11.3%, a 12-fold increase from its year-prior level. The Aaa-downgrade rate also increased dramatically to 0.9% from 0.02% a year ago, but was still low in absolute terms.

Despite the extreme rating volatility of 2007, Aaa-rated US HEL securities have exhibited high rating stability of over 99% to date and Aa-rated securities have still experienced slightly higher frequencies of upgrades than downgrades. However, securities carrying original ratings of single-A or lower have all experienced high cumulative downgrade rates.

Since transactions backed by first and second lien subprime mortgages account for the vast majority of the US HEL universe, and those issued between 2005 and 2007 account for most of the rating actions in 2007, we focus on these vintages in the following exhibits. Exhibits 17, 18, and 19 show the cumulative rating transition matrix for first and second lien subprime RMBS from the 2005, 2006, and 2007 vintages as of January 28, 2008.

With the exception of 2006 vintage second lien subprime securities, no Aaa-rated securities have been downgraded and Aa-rated securities have also experienced few downgrades. Securities backed by first lien mortgages from the 2005 vintage that were originally rated investment-grade still exhibited high stability rates. Securities rated single-A and below in the 2006 and 2007 vintages have underperformed, usually displaying downgrades rates in excess of 50%.

**Exhibit 17A: US Subprime Rating Transitions - 2005 Vintage First Lien Transactions as of 1/28/08**

| Orig Rtg | Current Rating/Last Rating before WR |                |                |                |                |               |              |             |             |
|----------|--------------------------------------|----------------|----------------|----------------|----------------|---------------|--------------|-------------|-------------|
|          | Aaa                                  | Aa             | A              | Baa            | Ba             | B             | Caa          | Ca          | C           |
| Aaa      | 100.0%<br>(2,054)                    |                |                |                |                |               |              |             |             |
| Aa       |                                      | 99.8%<br>(978) | 0.2%<br>(2)    |                |                |               |              |             |             |
| A        |                                      |                | 98.5%<br>(985) | 1.2%<br>(12)   | 0.3%<br>(3)    |               |              |             |             |
| Baa      |                                      |                |                | 93.5%<br>(994) | 4.0%<br>(42)   | 2.1%<br>(22)  | 0.5%<br>(5)  |             |             |
| Ba       |                                      |                |                |                | 80.4%<br>(254) | 13.9%<br>(44) | 4.7%<br>(15) | 0.6%<br>(2) | 0.3%<br>(1) |

Reprinted from Moody's Special Report, "U.S. Subprime RMBS 2005-2007 Vintage Rating Actions Update: January 2008," February 1, 2008.

<sup>10</sup> Downgrade statistics in Exhibits 16A and 16C are an underestimate of the amount of downgrade activity in 2007 because the rating must have been outstanding as of 1/1/07 in order to be counted in the downgrade rate. For US HEL, 3992 of the downgraded securities were outstanding as of 1/1/07 versus 5338 actual downgrades in 2007.

**Exhibit 17B: US Subprime Rating Transitions - 2005 Vintage Second Lien Transactions as of 1/28/08**

| Current Rating/Last Rating before WR |                 |               |               |               |               |               |               |               |               |  |
|--------------------------------------|-----------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|--|
| Orig Rtg                             | Aaa             | Aa            | A             | Baa           | Ba            | B             | Caa           | Ca            | C             |  |
| Aaa                                  | 100.0%<br>(113) |               |               |               |               |               |               |               |               |  |
| Aa                                   | 22.0%<br>(22)   | 75.0%<br>(75) | 3.0%<br>(3)   |               |               |               |               |               |               |  |
| A                                    | 0.9%<br>(1)     | 14.7%<br>(17) | 55.2%<br>(64) | 13.8%<br>(16) | 12.1%<br>(14) | 3.4%<br>(4)   |               |               |               |  |
| Baa                                  |                 |               |               | 37.7%<br>(55) | 13.7%<br>(20) | 19.2%<br>(28) | 13.0%<br>(19) | 8.9%<br>(13)  | 7.5%<br>(11)  |  |
| Ba                                   |                 |               |               |               | 6.1%<br>(4)   | 6.1%<br>(4)   | 4.5%<br>(3)   | 25.8%<br>(17) | 57.6%<br>(38) |  |

**Exhibit 18A: US Subprime Rating Transitions - 2006 Vintage First Lien Transactions as of 1/28/08**

| Current Rating/Last Rating before WR |                   |                   |                |                |                |                |                |                |                |  |
|--------------------------------------|-------------------|-------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|--|
| Orig Rtg                             | Aaa               | Aa                | A              | Baa            | Ba             | B              | Caa            | Ca             | C              |  |
| Aaa                                  | 100.0%<br>(2,113) |                   |                |                |                |                |                |                |                |  |
| Aa                                   |                   | 100.0%<br>(1,258) |                |                |                |                |                |                |                |  |
| A                                    |                   |                   | 43.6%<br>(562) | 28.0%<br>(361) | 17.9%<br>(231) | 10.2%<br>(131) | 0.2%<br>(2)    | 0.1%<br>(1)    |                |  |
| Baa                                  |                   |                   |                | 17.1%<br>(222) | 18.8%<br>(244) | 32.5%<br>(421) | 13.5%<br>(175) | 11.1%<br>(144) | 7.0%<br>(91)   |  |
| Ba                                   |                   |                   |                |                | 6.2%<br>(28)   | 18.4%<br>(83)  | 8.2%<br>(37)   | 14.0%<br>(63)  | 53.1%<br>(239) |  |

**Exhibit 18B: US Subprime Rating Transitions - 2006 Vintage Second Lien Transactions as of 1/28/08**

| Current Rating/Last Rating before WR |               |               |              |               |               |               |               |               |                |  |
|--------------------------------------|---------------|---------------|--------------|---------------|---------------|---------------|---------------|---------------|----------------|--|
| Orig Rtg                             | Aaa           | Aa            | A            | Baa           | Ba            | B             | Caa           | Ca            | C              |  |
| Aaa                                  | 53.2%<br>(99) | 34.9%<br>(65) | 3.2%<br>(6)  | 2.7%<br>(5)   | 4.3%<br>(8)   | 1.6%<br>(3)   |               |               |                |  |
| Aa                                   |               | 20.2%<br>(37) | 8.2%<br>(15) | 21.9%<br>(40) | 20.2%<br>(37) | 12.6%<br>(23) | 7.1%<br>(13)  | 6.0%<br>(11)  | 3.8%<br>(7)    |  |
| A                                    |               |               | 1.6%<br>(3)  | 5.9%<br>(11)  | 10.7%<br>(20) | 12.3%<br>(23) | 19.3%<br>(36) | 15.5%<br>(29) | 34.8%<br>(65)  |  |
| Baa                                  |               |               |              | 0.9%<br>(2)   | 1.4%<br>(3)   | 3.3%<br>(7)   | 6.5%<br>(14)  | 7.9%<br>(17)  | 79.9%<br>(171) |  |
| Ba                                   |               |               |              |               |               |               |               | 2.0%<br>(2)   | 98.0%<br>(97)  |  |

Reprinted from Moody's Special Report, "U.S. Subprime RMBS 2005-2007 Vintage Rating Actions Update: January 2008," February 1, 2008.

**Exhibit 19A: US Subprime Rating Transitions - 2007 Vintage First Lien Transactions as of 1/28/08**

| Current Rating/Last Rating before WR |                   |                 |                |                |                |                |               |               |               |  |
|--------------------------------------|-------------------|-----------------|----------------|----------------|----------------|----------------|---------------|---------------|---------------|--|
| Orig Rtg                             | Aaa               | Aa              | A              | Baa            | Ba             | B              | Caa           | Ca            | C             |  |
| Aaa                                  | 100.0%<br>(1,070) |                 |                |                |                |                |               |               |               |  |
| Aa                                   |                   | 100.0%<br>(651) |                |                |                |                |               |               |               |  |
| A                                    |                   |                 | 56.3%<br>(351) | 23.9%<br>(149) | 12.2%<br>(76)  | 5.1%<br>(32)   | 1.4%<br>(9)   | 1.0%<br>(6)   |               |  |
| Baa                                  |                   |                 |                | 30.0%<br>(176) | 18.9%<br>(111) | 23.5%<br>(138) | 8.5%<br>(50)  | 5.6%<br>(33)  | 13.5%<br>(79) |  |
| Ba                                   |                   |                 |                |                | 22.8%<br>(29)  | 11.0%<br>(14)  | 14.2%<br>(18) | 10.2%<br>(13) | 41.7%<br>(53) |  |

**Exhibit 19B: US Subprime Rating Transitions - 2007 Vintage Second Lien Transactions as of 1/28/08**

| Current Rating/Last Rating before WR |                |               |               |               |              |              |              |              |               |  |
|--------------------------------------|----------------|---------------|---------------|---------------|--------------|--------------|--------------|--------------|---------------|--|
| Orig Rtg                             | Aaa            | Aa            | A             | Baa           | Ba           | B            | Caa          | Ca           | C             |  |
| Aaa                                  | 100.0%<br>(70) |               |               |               |              |              |              |              |               |  |
| Aa                                   | 2.1%<br>(1)    | 91.7%<br>(44) |               |               | 6.3%<br>(3)  |              |              |              |               |  |
| A                                    |                |               | 44.1%<br>(26) | 27.1%<br>(16) | 10.2%<br>(6) | 11.9%<br>(7) | 3.4%<br>(2)  |              | 3.4%<br>(2)   |  |
| Baa                                  |                |               |               | 26.7%<br>(16) | 10.0%<br>(6) | 13.3%<br>(8) | 10.0%<br>(6) | 6.7%<br>(4)  | 33.3%<br>(20) |  |
| Ba                                   |                |               |               |               | 25.0%<br>(5) | 10.0%<br>(2) | 10.0%<br>(2) | 10.0%<br>(2) | 45.0%<br>(9)  |  |

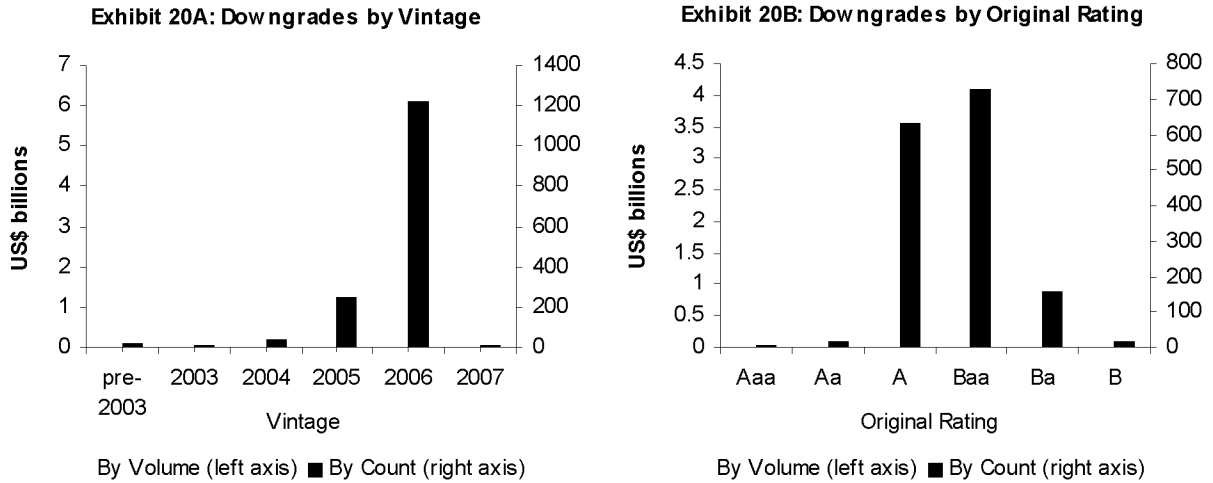
*Reprinted from Moody's Special Report, "U.S. Subprime RMBS 2005-2007 Vintage Rating Actions Update: January 2008," February 1, 2008.*

**US RMBS (includes Alt-A)**

Just as many of the subprime mortgage pools backing HEL securities were negatively impacted by the US housing recession in 2007, so were many Alt-A mortgage pools backing RMBS. Therefore, the US RMBS sector experienced negative trends in 2007 similar to those experienced by the US HEL sector. However, the number, frequency, and magnitude of downgrades were much smaller for the RMBS sector versus HEL. In all, 1555 US RMBS tranches from 392 deals were downgraded and 225 tranches from 75 deals were upgraded.

Like the HEL sector, downgrades for US RMBS were concentrated in the more recent vintages but in this case the 2006 vintage accounted for the bulk of the downgrades (79%) followed by the 2005 vintage (16%) (Exhibit 20A). At the end of 2007, the 2007 vintage was still relatively unscathed, but this vintage has also experienced significant downgrade activity in January 2008. Just as for HEL, the Baa and single-A rating categories bore the brunt of the downgrades with much smaller numbers of downgrades occurring among securities originally rated Aaa or Aa (Exhibit 20B).

**Exhibit 20: US RMBS Downgrades in 2007**



Approximately three-quarters of the upgrades in 2007 occurred on a single day when Moody's upgraded 171 tranches from 55 securitizations of jumbo prime residential mortgages due to low or no losses and high prepayment rates.<sup>11</sup> Another 12% of the upgrades involved transactions issued by Real Estate Synthetic Securities Investment (RESI) Finance Limited Partnership in 2003 and 2004.<sup>12</sup> These synthetic securitizations reference portfolios were made up of primarily jumbo mortgages.

For the US RMBS sector in 2007 (see Exhibit 21):

After enjoying a 12-month downgrade rate of less than 1% for the last decade, the frequency of downgrades jumped to 4.7% in 2007. At the same time, the upgrade rate declined from 1.6% in 2006 to 0.7% in 2007.

The average magnitude of rating downgrades rose one notch from 3.3 to 4.3, while the average size of rating upgrades declined to 2.1 notches from 2.4 notches.

The Aaa downgrade rate is still near zero as it has been for the last ten years, but the fallen angel rate rose along with the overall downgrade rate from 0.1% in 2006 to 2.6% in 2007.

Only 0.3% of securities originally rated Aaa have experienced cumulative downgrades to date. Rating actions taken against Aa-rated securities have been overwhelmingly positive and Ba and single-B rated securities have also experienced higher proportions of upgrades than downgrades. However, the opposite is true of single-A and Baa-rated securities due to downgrade activity in 2007.

The performance of the 2005, 2006, and 2007 Alt-A vintages is of particular interest because they are the major source of recent downgrade activity. Exhibit 22 displays the cumulative transition matrix by original rating for these vintages as of January 28, 2008. The pattern of rating transitions seen for these Alt-A vintages is similar to that of the corresponding first-lien subprime vintages. The highest rating categories have enjoyed good performance to date: only one Aaa-rated security has been downgraded (and only to Aa) and 4 Aa-rated securities have been downgraded. However, performance worsens significantly as we go down the rating scale and for the later vintages. Over 80% of the securities in most of the broad rating categories for the 2005 vintage have remained unchanged, but the majority of securities rated below Aa from the 2006 and 2007 vintages have been downgraded.

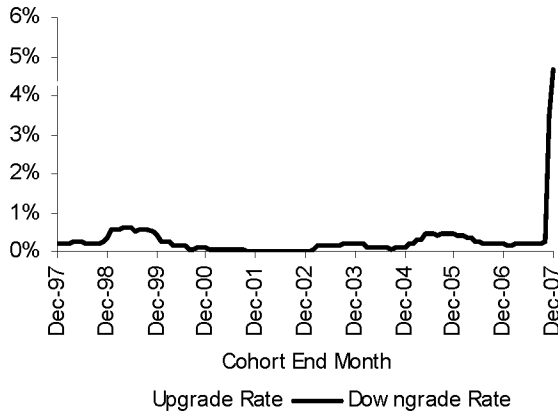
<sup>11</sup> See the related Moody's press release "Moody's upgrades 171 tranches of jumbo prime residential mortgage backed securities," July 17, 2007.

<sup>12</sup> See the related Moody's press release "Moody's takes actions on RESI," November 14, 2007.

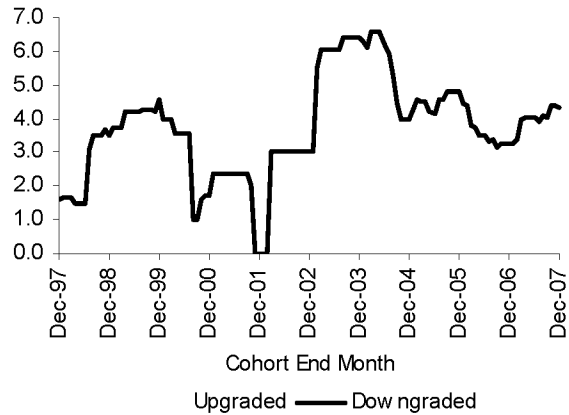


**Exhibit 21: US RMBS Rating Transition Trends**

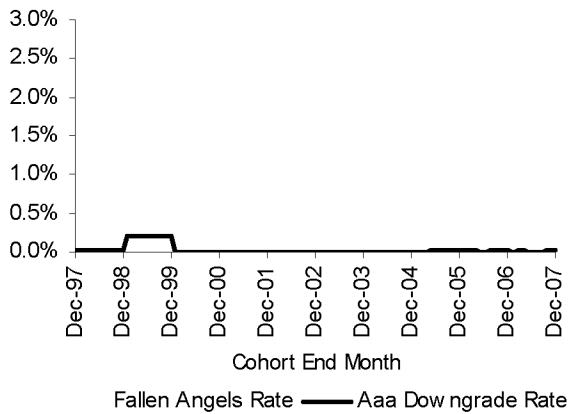
**Exhibit 21A: Upgrade and Downgrade Rates**



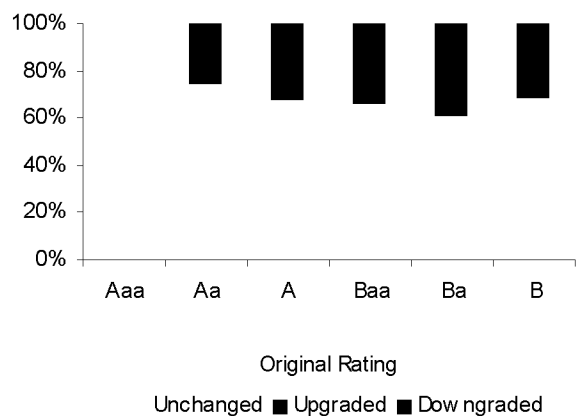
**Exhibit 21B: Average Number of Notches Upgraded or Downgraded**



**Exhibit 21C: Fallen Angel Rates and Aaa Downgrade Rates**



**Exhibit 21D: Cumulative Upgrade and Downgrade Rates by Original Rating**



**Exhibit 21E: Summary of Rating Transition Trends**

|  | 2007    | 2006   | 1998-2007 | 1998-2006 |
|--|---------|--------|-----------|-----------|
| Downgrade Rate                           | 4.69%   | 0.20%  | 0.40%     | 0.23%     |
| Upgrade Rate                             | 0.73%   | 1.56%  | 1.99%     | 2.28%     |
| Downgrade/Upgrade Ratio                  | 6.45    | 0.13   | 0.20      | 0.10      |
| Downgrade Rate (Notch Weighted)          | 20.35%  | 0.65%  | 1.72%     | 0.96%     |
| Upgrade Rate (Notch Weighted)            | 1.51%   | 3.79%  | 5.18%     | 6.05%     |
| Downgrade/Upgrade Ratio (Notch Weighted) | 13.46   | 0.17   | 0.33      | 0.16      |
| Rating Drift (Notch Weighted)            | -18.84% | 3.14%  | 3.46%     | 5.09%     |
| Rating Volatility (Notch Weighted)       | 21.87%  | 4.45%  | 6.90%     | 7.01%     |
| Stability Rate                           | 94.58%  | 98.24% | 97.61%    | 97.50%    |
| Average Number of Notches Downgraded     | 4.34    | 3.29   | 4.28      | 4.26      |
| Average Number of Notches Upgraded       | 2.08    | 2.44   | 2.61      | 2.66      |

**Exhibit 22A: US Alt-A Rating Transitions - 2005 Vintage Transactions as of 1/28/08**

| Current Rating/Last Rating before WR |                   |                 |                |                |               |               |              |             |             |
|--------------------------------------|-------------------|-----------------|----------------|----------------|---------------|---------------|--------------|-------------|-------------|
| Orig Rtg                             | Aaa               | Aa              | A              | Baa            | Ba            | B             | Caa          | Ca          | C           |
| Aaa                                  | 100.0%<br>(4,790) | 0.0%<br>(1)     |                |                |               |               |              |             |             |
| Aa                                   |                   | 100.0%<br>(879) |                |                |               |               |              |             |             |
| A                                    |                   |                 | 87.8%<br>(477) | 9.2%<br>(50)   | 1.7%<br>(9)   | 0.7%<br>(4)   | 0.6%<br>(3)  |             |             |
| Baa                                  |                   |                 |                | 80.5%<br>(490) | 8.5%<br>(52)  | 6.7%<br>(41)  | 1.8%<br>(11) | 1.0%<br>(6) | 1.5%<br>(9) |
| Ba                                   |                   |                 |                |                | 78.3%<br>(83) | 9.4%<br>(10)  | 5.7%<br>(6)  | 2.8%<br>(3) | 3.8%<br>(4) |
| B                                    |                   |                 |                |                |               | 88.2%<br>(15) | 11.8%<br>(2) |             |             |

**Exhibit 22B: US Alt-A Rating Transitions - 2006 Vintage Transactions as of 1/28/08**

| Current Rating/Last Rating before WR |                   |                  |                |                |                |                |               |              |              |
|--------------------------------------|-------------------|------------------|----------------|----------------|----------------|----------------|---------------|--------------|--------------|
| Orig Rtg                             | Aaa               | Aa               | A              | Baa            | Ba             | B              | Caa           | Ca           | C            |
| Aaa                                  | 100.0%<br>(4,829) |                  |                |                |                |                |               |              |              |
| Aa                                   | 0.2%<br>(2)       | 99.8%<br>(1,310) |                |                |                |                |               |              |              |
| A                                    |                   |                  | 55.0%<br>(482) | 29.8%<br>(261) | 12.7%<br>(111) | 2.3%<br>(20)   | 0.2%<br>(2)   |              |              |
| Baa                                  |                   |                  |                | 38.0%<br>(307) | 24.7%<br>(199) | 25.2%<br>(203) | 7.2%<br>(58)  | 2.4%<br>(19) | 2.6%<br>(21) |
| Ba                                   |                   |                  |                |                | 27.2%<br>(40)  | 23.8%<br>(35)  | 34.7%<br>(51) | 8.8%<br>(13) | 5.4%<br>(8)  |
| B                                    |                   |                  |                |                |                | 78.6%<br>(11)  |               |              | 21.4%<br>(3) |

**Exhibit 22C: US Alt-A Rating Transitions - 2007 Vintage Transactions as of 1/28/08**

| Current Rating/Last Rating before WR |                   |                |                |                |                |               |               |             |             |
|--------------------------------------|-------------------|----------------|----------------|----------------|----------------|---------------|---------------|-------------|-------------|
| Orig Rtg                             | Aaa               | Aa             | A              | Baa            | Ba             | B             | Caa           | Ca          | C           |
| Aaa                                  | 100.0%<br>(3,322) |                |                |                |                |               |               |             |             |
| Aa                                   |                   | 99.6%<br>(991) |                | 0.3%<br>(3)    | 0.1%<br>(1)    |               |               |             |             |
| A                                    |                   |                | 51.5%<br>(299) | 27.2%<br>(158) | 13.4%<br>(78)  | 6.0%<br>(35)  | 1.5%<br>(9)   | 0.2%<br>(1) | 0.2%<br>(1) |
| Baa                                  |                   |                |                | 40.4%<br>(207) | 23.2%<br>(119) | 17.7%<br>(91) | 15.4%<br>(79) | 1.8%<br>(9) | 1.6%<br>(8) |
| Ba                                   |                   |                |                |                | 38.3%<br>(31)  | 25.9%<br>(21) | 30.9%<br>(25) | 3.7%<br>(3) | 1.2%<br>(1) |
| B                                    |                   |                |                |                |                | 44.4%<br>(8)  | 55.6%<br>(10) |             |             |

Reprinted from Moody's Special Report, "U.S. Alt-A RMBS 2005-2007 Vintage Rating Actions Update: January 2008," February 1, 2008.

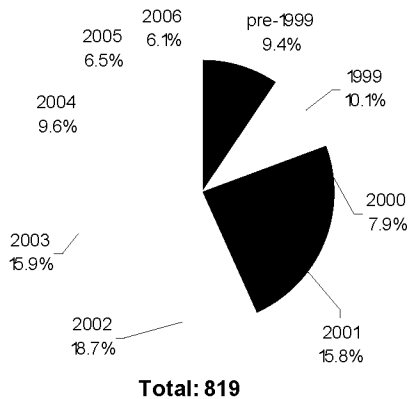
## US CMBS

The US CMBS sector continued to perform well in 2007, with upgrades outnumbering downgrades by a ratio of almost 13 to 1. In total, 819 ratings from 226 deals were upgraded and 64 ratings from 28 deals were downgraded in 2007. Increased subordination levels and defeasance were cited as the major cause for the great majority of CMBS upgrades, and for many, improved overall pool performance was also a contributing factor. Most of the CMBS downgrades resulted from realized and anticipated losses from specially serviced loans and LTV dispersion.

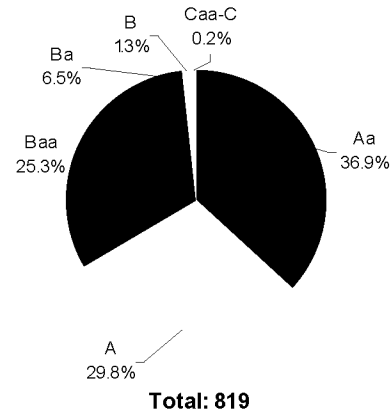
Securities with closing years between 2001 and 2003 accounted for 50% of CMBS upgrades, but upgrades were seen in every vintage between 1995 and 2006 (Exhibit 23A). Securities carrying investment-grade ratings at the beginning of the year were the main beneficiary of positive rating actions, contributing to 92% of upgrade activity (Exhibit 23B). In general, the likelihood of experiencing an upgrade in 2007 increased as the rating increased.

**Exhibit 23: Distribution of US CMBS Upgrades in 2007**

**Exhibit 23A: Upgrades by Vintage**



**Exhibit 23B: Upgrades by Rating as of 1/1/07**



While rating change activity for US CMBS has been overwhelmingly positive in recent years, concerns about the ongoing erosion of conduit loan underwriting caused Moody's to announce in April 2007 that it would phase-in higher subordination levels in Moody's-rated CMBS deals over the next few months.<sup>13</sup>

For the US CMBS sector in 2007 (see Exhibit 24):

The upgrade rate dropped from an all-time high of 16.6% in 2006 to 10.2% in 2007, but still remained much higher than the upgrade rates of all other structured finance sectors. The downgrade rate fell by 50% from 1.6% to 0.8%.

The average magnitude of upgrades declined slightly from 2.6 notches to 2.3 notches, while the average magnitude of downgrades stayed at 2.0 notches where it has been for the last 3 years.

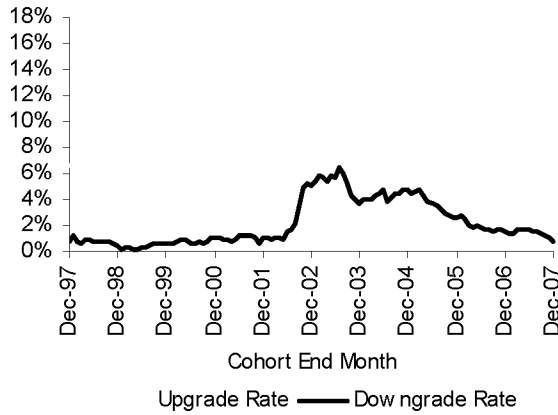
The fallen angel rate and Aaa downgrade rate were negligible in 2007. The Aaa downgrade rate has been low historically, with the exception of a spike in late 2002 through early 2003 due to concerns about terrorism insurance coverage for some deals.

To date, the stability rate of Aaa-rated CMBS has been over 99%, while Aa and single-A rated CMBS have experienced roughly 40% cumulative upgrade rates. Only securities rated single-B or below have higher cumulative proportions of downgrades than upgrades.

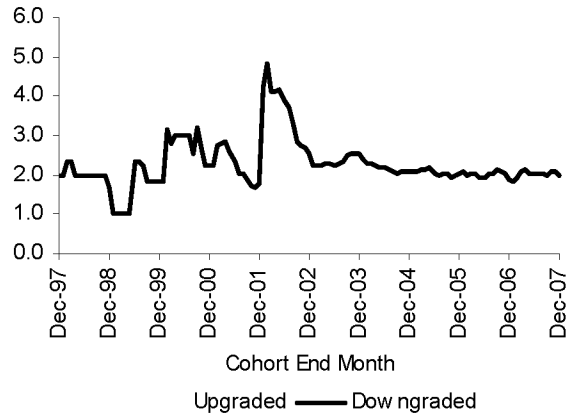
<sup>13</sup> See "US CMBS: Conduit Loan Underwriting Continues to Slide - Credit Enhancement Increase Likely," *Moody's Special Report*, April 10, 2007.

**Exhibit 24: US CMBS Rating Transition Trends**

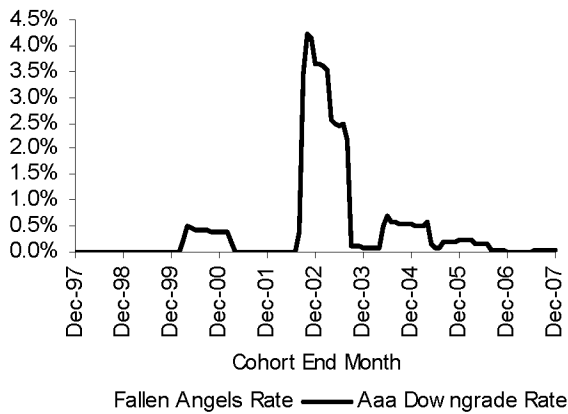
**Exhibit 24A: Upgrade and Downgrade Rates**



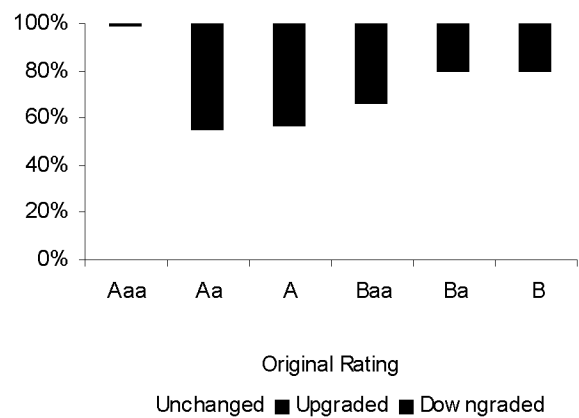
**Exhibit 24B: Average Number of Notches Upgraded or Downgraded**



**Exhibit 24C: Fallen Angel Rates and Aaa Downgrade Rates**



**Exhibit 24D: Cumulative Upgrade and Downgrade Rates by Original Rating**



**Exhibit 24E: Summary of Rating Transition Trends**

|  | 2007   | 2006   | 1998-2007 | 1998-2006 |
|--|--------|--------|-----------|-----------|
| Downgrade Rate                           | 0.80%  | 1.60%  | 2.61%     | 2.97%     |
| Upgrade Rate                             | 10.19% | 16.55% | 9.89%     | 8.65%     |
| Downgrade/Upgrade Ratio                  | 0.08   | 0.10   | 0.26      | 0.34      |
| Downgrade Rate (Notch Weighted)          | 1.59%  | 3.01%  | 5.78%     | 6.67%     |
| Upgrade Rate (Notch Weighted)            | 23.51% | 43.55% | 24.01%    | 20.72%    |
| Downgrade/Upgrade Ratio (Notch Weighted) | 0.07   | 0.07   | 0.24      | 0.32      |
| Rating Drift (Notch Weighted)            | 21.92% | 40.54% | 18.23%    | 14.05%    |
| Rating Volatility (Notch Weighted)       | 25.10% | 46.55% | 29.79%    | 27.39%    |
| Stability Rate                           | 89.02% | 81.85% | 87.50%    | 88.38%    |
| Average Number of Notches Downgraded     | 2.00   | 1.88   | 2.22      | 2.24      |
| Average Number of Notches Upgraded       | 2.31   | 2.63   | 2.43      | 2.39      |

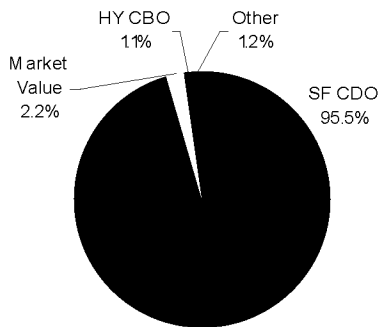
## US CDOs

The extreme rating volatility of the subprime and Alt-A RMBS sectors in 2007 had a direct and negative impact on US CDOs, particularly for structured finance CDOs (SF CDOs)<sup>14</sup>, those transactions backed primarily by structured finance securities. Following the large numbers of downgrades in the US HEL and RMBS sectors, downgrades among US CDOs totaled 1453 among 491 deals for 2007. US CDO upgrade activity was limited to 109 tranches from 48 deals producing a downgrade-to-upgrade ratio of 13 to 1.

95% of the US CDO downgrades in 2007 occurred among SF CDOs, mostly due to their exposure to poorly performing RMBS securities in the underlying collateral pools (Exhibit 25A). Market value CDOs, which were hurt by stressful market conditions, were a distant second in downgrade activity.

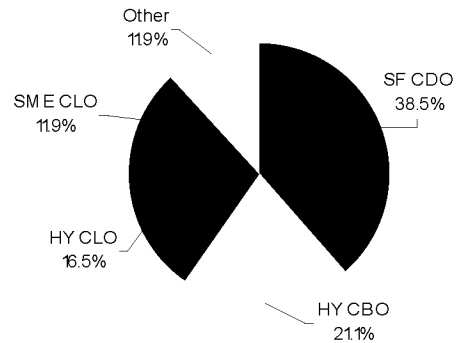
**Exhibit 25: Distribution of US CDO Rating Changes in 2007**

**Exhibit 25A: Downgrades by Deal Type**



Total: 1453

**Exhibit 25B: Upgrades by Deal Type**

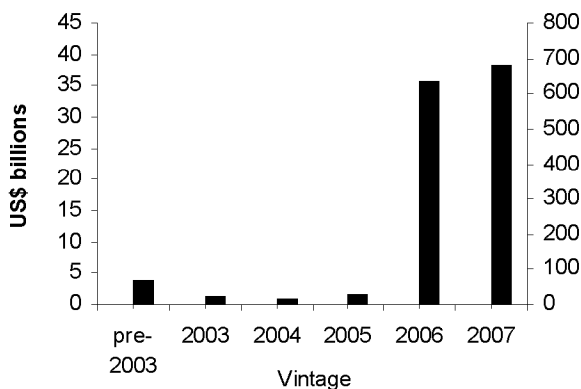


Total: 109

SF CDOs were also the leaders in upgrade activity (39%), followed by high-yield CBOs (HY CBOs at 21%), high-yield CLOs (HY CLOs at 17%), and CDOs backed by small- and medium-sized enterprise loans (SME CLOs at 12%) (Exhibit 25B). Most of the upgrades cited the ongoing delevering of the transaction as a primary factor behind the rating action and roughly two-thirds of the upgrades occurred among deals securitized between 1999 and 2001.

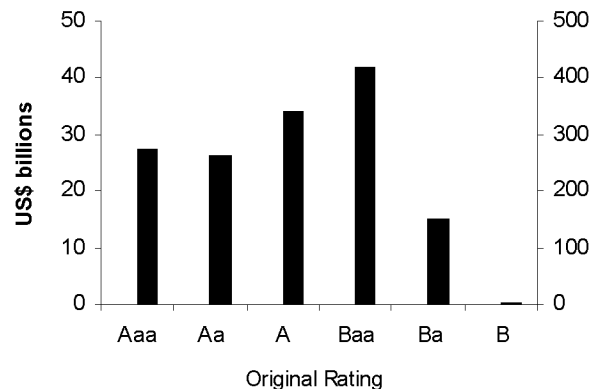
**Exhibit 26: US CDO Downgrades in 2007**

**Exhibit 26A: Downgrades by Vintage**



By Volume (left axis) ■ By Count (right axis)

**Exhibit 26B: Downgrades by Original Rating**



By Volume (left axis) ■ By Count (right axis)

<sup>14</sup> SF CDOs are also commonly called ABS CDOs or resecuritization CDOs.

Over 90% of the CDO downgrades, both by count and volume, occurred among deals issued in 2006 and 2007 as they had the most significant exposure to the poorly performing 2006 and 2007 subprime and Alt-A vintages (Exhibit 26A). Like US HEL and RMBS, Baa and single-A rated CDO securities, were the most downgraded rating categories by count (Exhibit 26B). However, in contrast to the mortgage-backed sectors, CDO downgrade activity was more evenly distributed among ratings with significant downgrades occurring among securities originally rated Aaa and Aa. Because the size of a tranche in a deal generally increases with the seniority and rating of the tranche, downgrade volume by original rating followed this same pattern with Aaa securities accounting for 57% of the 2007 downgrades by volume, declining to 16% for Aa, 13% for single-A and 11% for Baa.

For the US CDO sector in 2007 (see Exhibit 27)<sup>15</sup>:

The 12-month downgrade rate increased to 8.4%, up sharply from its year-prior level of 2.6% and higher than the historical average of 6.6%. The upgrade rate mirrored the opposite trend, declining to 1.3%, lower than both its level of 3.2% one year prior and the historical average of 1.5%.

The average severity of rating downgrades more than doubled from 2.9 notches in 2006 to 6.8 notches in 2007. The average magnitude of rating upgrades fell by almost a notch from 3.9 notches to 3.0 notches.

After almost 2 years of low incidences of fallen angels and Aaa downgrades, both rates climbed precipitously in 2007 to 5.5% for fallen angels and 3.1% for Aaa downgrades. The increase has been steeper than in late 2001 and 2002 when high-yield CBOs were in distress.

Aaa-rated CDO securities have been less stable than those in other sectors, experiencing a 7.5% cumulative downgrade rate to date, although much of the downgrades occurred in 2007. Cumulative downgrade rates are roughly rank-ordered by original rating and upgrade activity has been low.

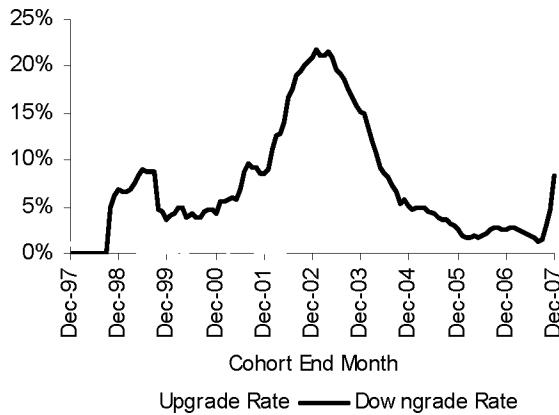
Exhibit 28 shows the 12-month downgrade and upgrade rates for a few CDO deal types. HY CBOs, investment-grade (IG) CBOs, and synthetic arbitrage CDOs have all experienced peaks of downgrade activity in the past, although negative rating actions have been much more muted for these categories recently (Exhibit 28A). The 12-month downgrade rate for SF CDOs reached 20% in 2007, easily surpassing its previous peak of 15.6% for the cohort ending February 2005. Interestingly, all four CDO subsectors experienced a revival in upgrade activity in late 2006 to early 2007, but upgrade rates had fallen by late 2007 (Exhibit 28C).

Downgrades for HY CLOs, preferred stock CDOs, and SME CLOs have been low to non-existent in the last three years (Exhibit 28B). Although it appears that there was a spike in downgrade activity for preferred stock CDOs and SME CLOs in late 2002 to early 2003, only three tranches from one SME CLO and 10 tranches from 10 preferred stock CDOs have ever been downgraded. Market-value CDOs had experienced low downgrade rates until recently, when the 12-month downgrade rate climbed to 11%.

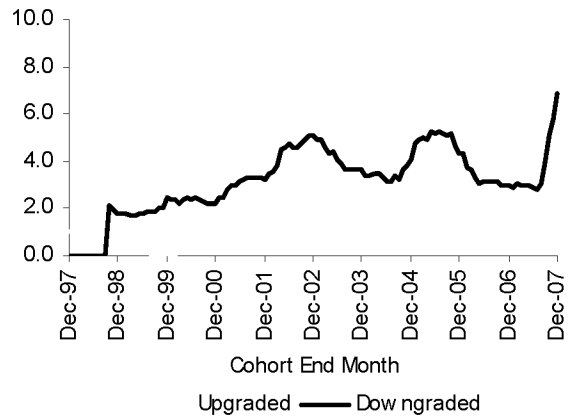
<sup>15</sup> Downgrade statistics in Exhibits 27A and 27C are underestimates of the amount of downgrade activity in 2007 because the rating must have been outstanding as of 1/1/07 in order to be counted in the downgrade rate. For US CDOs, 707 of the downgraded securities were outstanding as of 1/1/07 versus 1453 actual downgrades in 2007.

### Exhibit 27: US CDO Rating Transition Trends

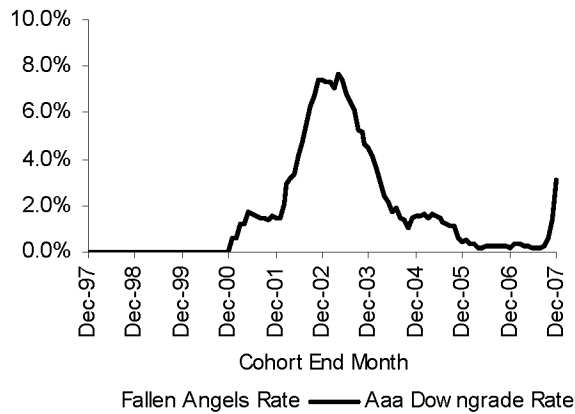
**Exhibit 27A: Upgrade and Downgrade Rates**



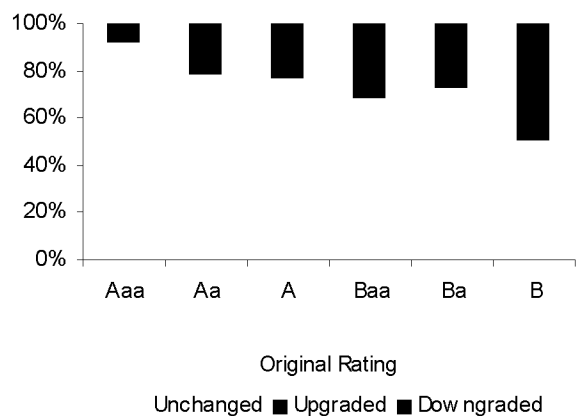
**Exhibit 27B: Average Number of Notches Upgraded or Downgraded**



**Exhibit 27C: Fallen Angel Rates and Aaa Downgrade Rates**



**Exhibit 27D: Cumulative Upgrade and Downgrade Rates by Original Rating**

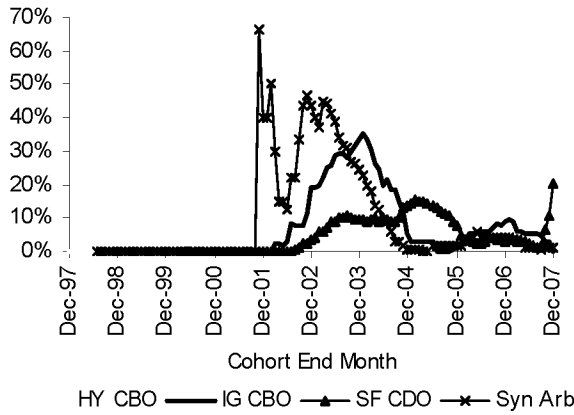


**Exhibit 27E: Summary of Rating Transition Trends**

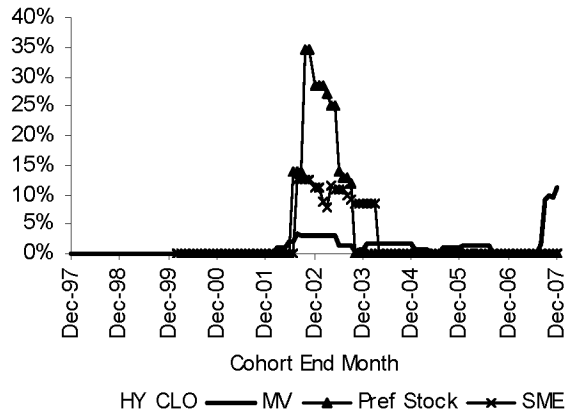
|  | 2007    | 2006   | 1998-2007 | 1998-2006 |
|--|---------|--------|-----------|-----------|
| Downgrade Rate                           | 8.37%   | 2.63%  | 6.58%     | 7.87%     |
| Upgrade Rate                             | 1.29%   | 3.23%  | 1.52%     | 1.11%     |
| Downgrade/Upgrade Ratio                  | 6.49    | 0.81   | 4.32      | 7.12      |
| Downgrade Rate (Notch Weighted)          | 57.32%  | 7.73%  | 26.76%    | 31.31%    |
| Upgrade Rate (Notch Weighted)            | 3.89%   | 12.44% | 5.18%     | 3.66%     |
| Downgrade/Upgrade Ratio (Notch Weighted) | 14.72   | 0.62   | 5.17      | 8.55      |
| Rating Drift (Notch Weighted)            | -53.43% | 4.71%  | -21.58%   | -27.65%   |
| Rating Volatility (Notch Weighted)       | 61.22%  | 20.17% | 31.94%    | 34.97%    |
| Stability Rate                           | 90.34%  | 94.15% | 91.90%    | 91.02%    |
| Average Number of Notches Downgraded     | 6.85    | 2.94   | 4.07      | 3.98      |
| Average Number of Notches Upgraded       | 3.02    | 3.86   | 3.40      | 3.31      |

**Exhibit 28: 12-month Transition Rates for Select US CDO Deal Types**

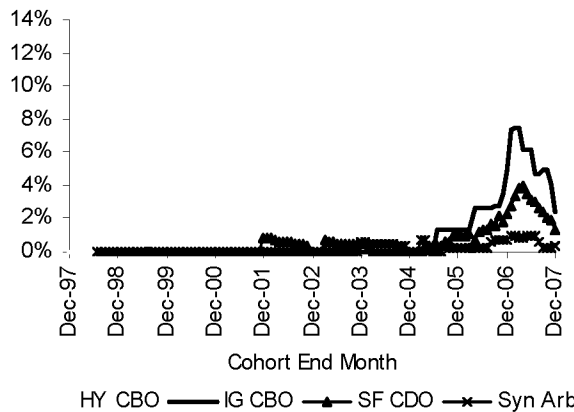
**Exhibit 28A: 12-month Downgrade Rates**



**Exhibit 28B: 12-month Downgrade Rate**



**Exhibit 28C: 12-month Upgrade Rates**



**Exhibit 28D: 12-month Upgrade Rates**

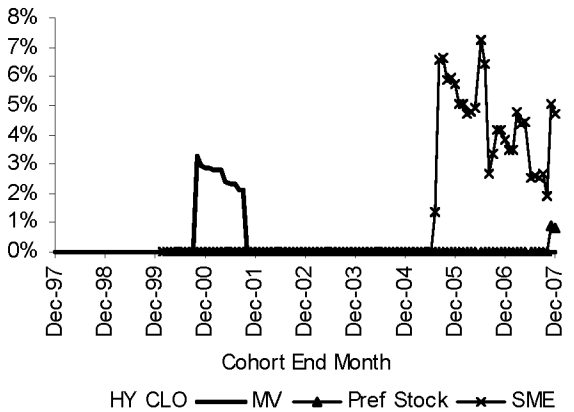


Exhibit 29 shows the cumulative transition matrix to date for the 2006 and 2007 vintage US SF CDOs. Downgrade activity has been substantial in every rating category. More than 75% of securities from the 2007 vintage that originally carried ratings of single-A, Baa, and Ba have been downgraded and more than 55% of securities from the 2006 vintage in these rating categories have been downgraded.

**Exhibit 29A: US SF CDO Rating Transitions – 2006 Vintage Transactions as of 12/31/07**

|          |                | Rating as of 12/31/07 |                |               |               |               |               |               |             |  |
|----------|----------------|-----------------------|----------------|---------------|---------------|---------------|---------------|---------------|-------------|--|
| Orig Rtg | Aaa            | Aa                    | A              | Baa           | Ba            | B             | Caa           | Ca/C          | WR          |  |
| Aaa      | 84.5%<br>(487) | 2.1%<br>(12)          | 4.5%<br>(26)   | 3.1%<br>(18)  | 2.4%<br>(14)  | 1.2%<br>(7)   | 0.7%<br>(4)   | 0.5%<br>(3)   | 0.9%<br>(5) |  |
| Aa       |                | 65.4%<br>(208)        | 8.5%<br>(27)   | 9.1%<br>(29)  | 6.0%<br>(19)  | 3.1%<br>(10)  | 5.4%<br>(17)  | 1.6%<br>(5)   | 0.9%<br>(3) |  |
| A        |                |                       | 42.6%<br>(120) | 18.8%<br>(53) | 18.4%<br>(52) | 5.0%<br>(14)  | 8.5%<br>(24)  | 6.7%<br>(19)  |             |  |
| Baa      |                |                       |                | 35.5%<br>(98) | 19.2%<br>(53) | 12.7%<br>(35) | 13.4%<br>(37) | 18.8%<br>(52) | 0.4%<br>(1) |  |
| Ba       |                |                       |                |               | 24.5%<br>(27) | 24.5%<br>(27) | 18.2%<br>(20) | 30.0%<br>(33) | 2.7%<br>(3) |  |
| B        |                |                       |                |               |               |               |               | 100.0%<br>(2) |             |  |



**Exhibit 29B: US SF CDO Rating Transitions – 2007 Vintage Transactions as of 12/31/07**

Rating as of 12/31/07

| Orig Rtg | Aaa            | Aa            | A             | Baa           | Ba            | B             | Caa           | Ca/C          | WR |
|----------|----------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|----|
| Aaa      | 71.0%<br>(411) | 3.6%<br>(21)  | 8.5%<br>(49)  | 8.6%<br>(50)  | 4.2%<br>(24)  | 2.3%<br>(13)  | 1.4%<br>(8)   | 0.5%<br>(3)   |    |
| Aa       |                | 39.6%<br>(84) | 15.6%<br>(33) | 18.9%<br>(40) | 9.4%<br>(20)  | 3.8%<br>(8)   | 8.0%<br>(17)  | 4.7%<br>(10)  |    |
| A        |                |               | 22.5%<br>(44) | 21.4%<br>(42) | 18.4%<br>(36) | 10.2%<br>(20) | 16.3%<br>(32) | 11.2%<br>(22) |    |
| Baa      |                |               |               | 21.2%<br>(48) | 20.4%<br>(46) | 17.7%<br>(40) | 22.1%<br>(50) | 18.6%<br>(42) |    |
| Ba       |                |               |               |               | 23.7%<br>(14) | 11.9%<br>(7)  | 25.4%<br>(15) | 39.0%<br>(23) |    |

*The transition statistics are from Moody's Special Report, "Structured Finance CDO Ratings Surveillance Brief: December 2007," January 17, 2008.*

## Other Structured Finance

The other structured finance category contains a diverse group of asset types outside of the four major sectors (ABS, RMBS, CMBS, and CDOs), including asset-backed commercial paper (ABCP), structured covered bonds, insurance-linked securities such as catastrophe bonds, structured investment vehicles (SIVs), and derivative product companies (DPCs).<sup>16</sup> Prior to 2007, the performance of this sector had been excellent with very few downgrades and a scattering of upgrades. While the rating performance of structured covered bond programs remained pristine in 2007 and there were also no downgrades among insurance-linked securities this year, two ABCP programs, almost all SIVs, and one DPC were negatively affected by the turmoil in the credit markets.

In summary for 2007:

**ABCP:** Five notes from three ABCP programs were downgraded. One downgrade was due to structural changes and unrelated to performance, but the other four downgrades were caused by the difficult market conditions in 2007. The subordinated notes of Broadhollow Funding LLC, which provided a prime mortgage warehouse facility for its sponsor, American Home Mortgage Investment Corp., were downgraded after the sponsor filed for bankruptcy under Chapter 11 in August 2007. The notes were ultimately downgraded to Ca in December 2007. Three subordinated notes of Ottimo Funding Ltd. were downgraded due to declines in the market value of the assets, a portfolio of Aaa-rated RMBS. These notes were downgraded to C.

**DPCs:** The capital notes of Saint Germain Holdings, Ltd., a derivative product company, were downgraded to reflect the deterioration of the market value of the asset portfolio.

**SIVs<sup>17</sup>:** Perhaps no other asset type has been as negatively affected by the events of 2007 as SIVs. To a certain extent, all SIVs have suffered, but the magnitude of the impact has varied from vehicle to vehicle. By the end of 2007, 35 ratings from 20 programs had been downgraded<sup>18</sup> and more remain on review for downgrade in 2008 as managers explore their options in the current difficult environment. The main rationale behind the actions is the deterioration of SIV portfolio market values and the inability of SIVs to issue new debt or refinance maturing debt.

The cumulative transition matrix for SIVs by original rating is presented in Exhibit 30. It should be noted that prior to 2007, no SIV had ever experienced a downgrade. However, now that downgrades have occurred, they have affected all rating categories. For the mezzanine and capital notes (those rated below Aaa), at least 75% have been downgraded in every rating category, usually to Caa and below. For the medium term note programs and senior notes (those rated Aaa), close to 30% have been downgraded, many to below investment-grade ratings.

### Exhibit 30: Global SIV Rating Transitions by Original Rating as of 12/31/07

| Orig Rtg | Total | Current Rating/Last Rating before WR |        |        |        |       |       |               |
|----------|-------|--------------------------------------|--------|--------|--------|-------|-------|---------------|
|          |       | Aaa                                  | Aa     | A      | Baa    | Ba    | B     | Caa and below |
| Aaa      | 35    | 71.43%                               | 5.71%  |        | 5.71%  | 5.71% | 5.71% | 5.71%         |
| Aa       | 4     |                                      | 25.00% | 25.00% |        |       |       | 50.00%        |
| A        | 8     |                                      |        | 12.50% |        |       |       | 87.50%        |
| Baa      | 18    |                                      |        |        | 16.67% |       | 5.56% | 77.78%        |

*Note: Each unique program within the SIV (i.e. each program with the same rating) is counted once, regardless of how many securities are issued out of the program.*

<sup>16</sup> This study only covers long-term ratings issued under these programs. A short-term rating transition study is forthcoming.

<sup>17</sup> Moody's has published a number of recent reports on SIVs. For example, see "FAQs Regarding Current State of the Structured Investment Vehicle (SIV) Market," *Moody's Special Report*, January 15, 2008 and "Moody's Update on Structured Investment Vehicles," *Moody's Special Report*, January 16, 2008.

<sup>18</sup> While some short-term ratings of SIVs were also downgraded in 2007, only long-term ratings are discussed here.

## Regional Comparisons of Rating Transitions

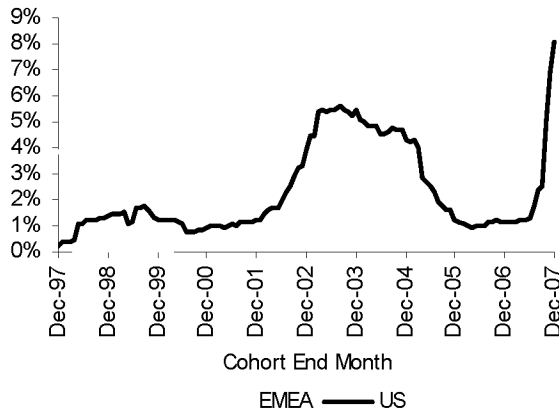
### EMEA and US Rating Transitions<sup>19</sup>

While the lack of subprime mortgage securitizations in EMEA helped the structured finance market in this region avoid the massive numbers of negative rating actions that occurred in the US, the effects of these downgrades and subsequent volatility in market prices and liquidity were still felt among European CDOs and SIVs. All told, 249 ratings from 99 deals were downgraded and 240 ratings from 99 deals were upgraded during the year. CDOs led both downgrades (71%) and upgrades (63%). The second largest contributor of upgrade activity was CMBS (18%), followed by RMBS (10%), and ABS (9%). The other structured finance category, namely SIVs, accounted for 12% of downgrades, followed by ABS (10%), RMBS (4%), and CMBS (2%).

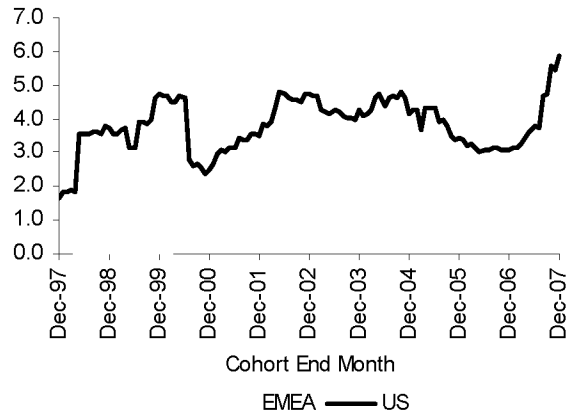
The 12-month frequencies of downgrades for EMEA and the US have tracked each other closely historically, but Europe did not experience the same dramatic increase in downgrades that the US did in 2007. Both regions reported a 1.2% downgrade rate in 2006, but that number rose to 2.7% in 2007 for EMEA and 8.1% for the US (Exhibit 31). The movement of the average magnitude of rating downgrades has also been highly correlated between the regions, but the size of EMEA downgrades has consistently been below that of the US and the gap widened during the year, ending at 3.2 notches for EMEA and 5.9 notches for the US for the cohort ending December 2007.

**Exhibit 31: Comparison of Rating Transition Trends for EMEA and US Structured Finance**

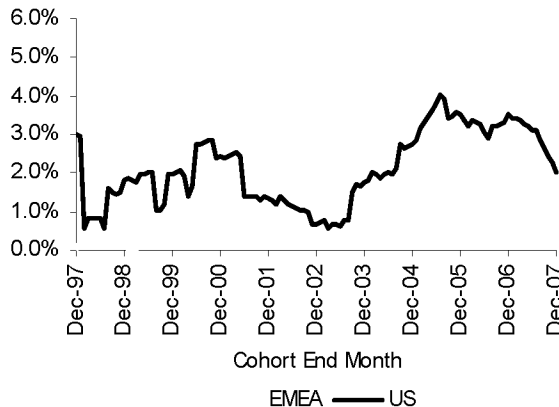
**Exhibit 31A: 12-month Downgrade Rates**



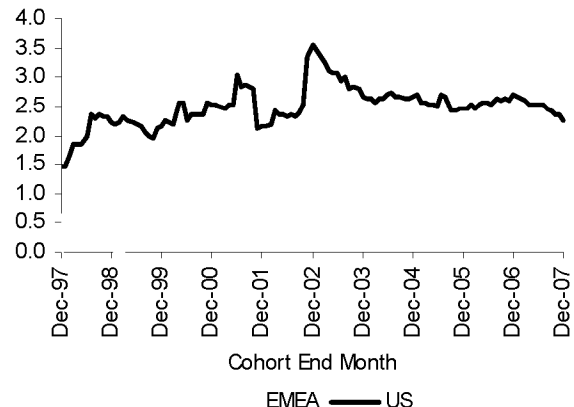
**Exhibit 31B: Average Number of Notches Downgraded**



**Exhibit 31C: 12-month Upgrade Rates**



**Exhibit 31D: Average Number of Notches Upgraded**



<sup>19</sup> A separate study for EMEA structured finance rating transitions is forthcoming.

### Exhibit 31E: Summary of Rating Transition Trends

|  | EMEA   |        |           | US      |        |           |
|--|--------|--------|-----------|---------|--------|-----------|
|  | 2007   | 2006   | 1998-2007 | 2007    | 2006   | 1998-2007 |
| Downgrade Rate                           | 2.65%  | 1.22%  | 2.40%     | 8.10%   | 1.18%  | 2.62%     |
| Upgrade Rate                             | 2.97%  | 3.17%  | 3.12%     | 2.04%   | 3.52%  | 2.45%     |
| Downgrade/Upgrade Ratio                  | 0.89   | 0.38   | 0.77      | 3.98    | 0.33   | 1.07      |
| Downgrade Rate (Notch Weighted)          | 8.61%  | 2.34%  | 6.34%     | 47.43%  | 3.64%  | 11.38%    |
| Upgrade Rate (Notch Weighted)            | 6.36%  | 6.35%  | 6.31%     | 4.61%   | 9.46%  | 6.21%     |
| Downgrade/Upgrade Ratio (Notch Weighted) | 1.35   | 0.37   | 1.01      | 10.28   | 0.38   | 1.83      |
| Rating Drift (Notch Weighted)            | -2.26% | 4.01%  | -0.04%    | -42.82% | 5.82%  | -5.17%    |
| Rating Volatility (Notch Weighted)       | 14.97% | 8.69%  | 12.65%    | 52.05%  | 13.09% | 17.60%    |
| Stability Rate                           | 94.38% | 95.61% | 94.48%    | 89.86%  | 95.30% | 94.93%    |
| Average Number of Notches Downgraded     | 3.24   | 1.92   | 2.65      | 5.86    | 3.08   | 4.35      |
| Average Number of Notches Upgraded       | 2.14   | 2.01   | 2.02      | 2.27    | 2.69   | 2.54      |

The EMEA upgrade rate dipped slightly in 2007 from 3.2% in 2006 to 3.0% in 2007, a much smaller decrease than that experienced by the US. Like downgrades, the average magnitude of EMEA upgrades has been below that of the US for the last 5 years, but unlike downgrades, this number seemed to be converging in 2007 to approximately 2.2 notches for both regions.

Exhibit 32 compares the US and EMEA 12-month rating transition matrix for 2007. Aaa- and Aa-rated securities experienced similar stability rates across regions, but downgrade rates for all other rating categories were much lower in EMEA than in the US. Moreover, frequencies of transitions to Caa and below were generally much higher in the US than in EMEA.

### Exhibit 32: EMEA and US Structured Finance 12-month Rating Transition Matrices for 2007

| EMEA in 2007  | Aaa    | Aa     | A      | Baa    | Ba     | B       | Caa and below |
|---------------|--------|--------|--------|--------|--------|---------|---------------|
| Aaa           | 99.35% | 0.53%  |        | 0.06%  |        | 0.03%   | 0.03%         |
| Aa            | 3.37%  | 93.39% | 2.78%  | 0.33%  |        |         | 0.13%         |
| A             | 0.34%  | 2.53%  | 94.66% | 1.64%  | 0.55%  | 0.07%   | 0.21%         |
| Baa           | 0.15%  | 0.46%  | 2.08%  | 94.83% | 1.24%  | 0.23%   | 1.00%         |
| Ba            | 1.13%  |        |        | 1.58%  | 94.80% | 1.58%   | 0.90%         |
| B             |        |        |        |        |        | 100.00% |               |
| Caa and below | 3.64%  |        |        | 1.82%  |        |         | 94.55%        |
| US in 2007    | Aaa    | Aa     | A      | Baa    | Ba     | B       | Caa and below |
| Aaa           | 99.59% | 0.18%  | 0.08%  | 0.06%  | 0.05%  | 0.03%   | 0.02%         |
| Aa            | 3.65%  | 93.66% | 0.74%  | 0.67%  | 0.52%  | 0.24%   | 0.52%         |
| A             | 0.61%  | 3.18%  | 80.56% | 7.85%  | 4.25%  | 1.76%   | 1.80%         |
| Baa           | 0.34%  | 0.19%  | 1.81%  | 73.40% | 7.74%  | 8.35%   | 8.17%         |
| Ba            | 0.15%  | 0.08%  | 0.18%  | 1.58%  | 73.39% | 6.53%   | 18.10%        |
| B             | 0.14%  |        | 0.07%  | 0.22%  | 1.23%  | 91.74%  | 6.59%         |
| Caa and below |        |        |        | 0.09%  | 0.18%  | 0.54%   | 99.19%        |

## Asia-Pacific and US Rating Transitions<sup>20</sup>

The Asia-Pacific structured finance market managed to stay clear of most of the turmoil occurring in the US and Europe in 2007. There were almost 5 upgrades for every downgrade in the region. During the year, 22 ratings from 11 deals were downgraded and 105 ratings from 68 deals were upgraded. Of the 22 downgrades, 14 occurred among CDOs experiencing deterioration in the credit quality of the underlying portfolio, while 5 downgrades involved ABS backed by Japanese consumer loans, and the remaining 3 were due to ABS backed by equipment leases. CMBS accounted for the largest share of upgrades (40%), followed by CDOs (24%), ABS (21%), and RMBS (15%). Most of the upgrades reflected the increased credit enhancement for the securities, which resulted from the redemption of senior classes in a sequential manner.

The structured finance downgrade rates of the Asia-Pacific and the US have been historically uncorrelated. Similarly, in 2007, the Asia-Pacific downgrade rate, unlike that of the US, barely moved from its level in 2006, ticking upwards from 0.8% to 0.9% (Exhibit 33). However, the average number of notches downgraded in the Asia-Pacific region did experience a more significant increase, rising 1.4 notches to 2.5 notches for the cohort ending December 2007.

The 12-month frequency of upgrades for Asia-Pacific structured finance has had a more similar pattern to the US upgrade rate, and like in the US, the upgrade rate declined in 2007 to 4.5% from 5.6% the previous year. The average size of rating upgrades was flat for the year at approximately 2.8 notches.

### Exhibit 33: Comparison of Rating Transition Trends for Asia-Pacific and US Structured Finance

Exhibit 33A: 12-month Downgrade Rates

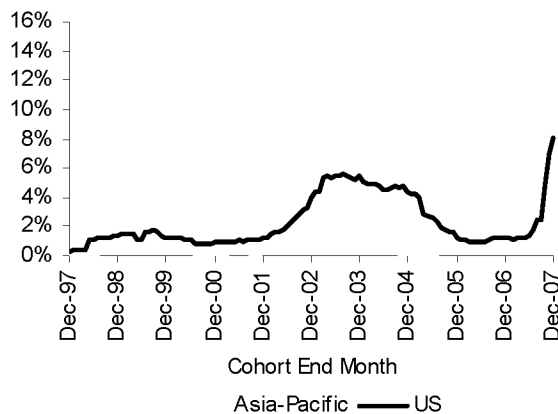


Exhibit 33B: Average Number of Notches Downgraded

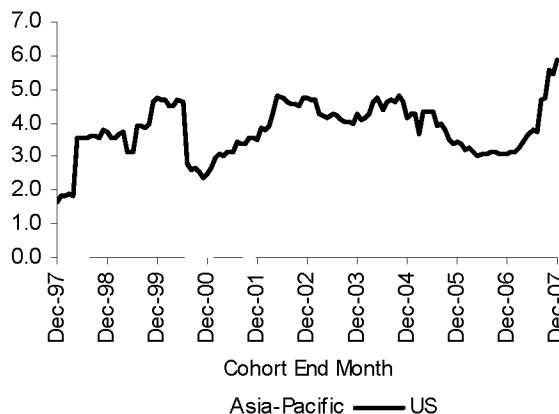


Exhibit 33C: 12-month Upgrade Rates

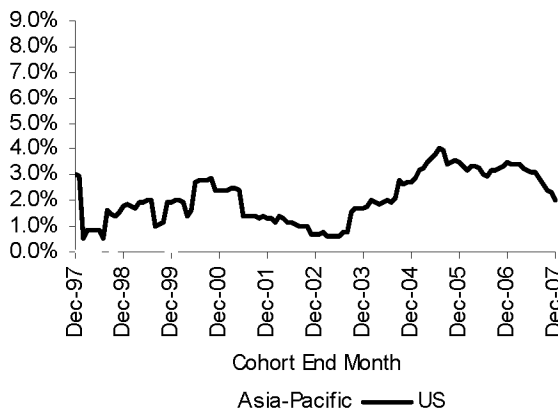
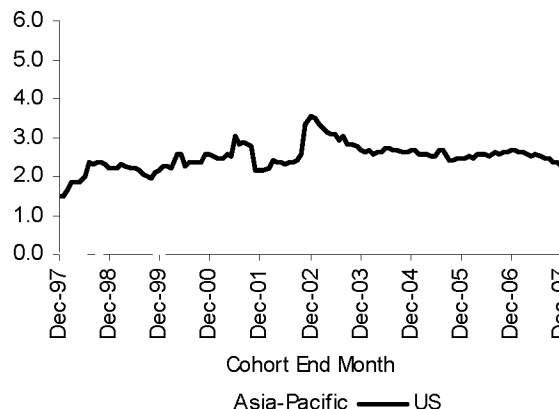


Exhibit 33D: Average Number of Notches Upgraded



<sup>20</sup> Two separate studies focusing on structured finance rating transitions in Japan and in the Asia-Pacific region ex Japan are forthcoming.

**Exhibit 33E: Summary of Rating Transition Trends**

|  | Asia-Pacific |        |           | US      |        |           |
|--|--------------|--------|-----------|---------|--------|-----------|
|  | 2007         | 2006   | 1998-2007 | 2007    | 2006   | 1998-2007 |
| Downgrade Rate                           | 0.94%        | 0.78%  | 0.80%     | 8.10%   | 1.18%  | 2.62%     |
| Upgrade Rate                             | 4.54%        | 5.63%  | 4.19%     | 2.04%   | 3.52%  | 2.45%     |
| Downgrade/Upgrade Ratio                  | 0.21         | 0.14   | 0.19      | 3.98    | 0.33   | 1.07      |
| Downgrade Rate (Notch Weighted)          | 2.34%        | 0.89%  | 1.48%     | 47.43%  | 3.64%  | 11.38%    |
| Upgrade Rate (Notch Weighted)            | 12.82%       | 16.20% | 11.78%    | 4.61%   | 9.46%  | 6.21%     |
| Downgrade/Upgrade Ratio (Notch Weighted) | 0.18         | 0.05   | 0.13      | 10.28   | 0.38   | 1.83      |
| Rating Drift (Notch Weighted)            | 10.48%       | 15.31% | 10.30%    | -42.82% | 5.82%  | -5.17%    |
| Rating Volatility (Notch Weighted)       | 15.15%       | 17.08% | 13.25%    | 52.05%  | 13.09% | 17.60%    |
| Stability Rate                           | 94.53%       | 93.59% | 95.01%    | 89.86%  | 95.30% | 94.93%    |
| Average Number of Notches Downgraded     | 2.50         | 1.13   | 1.85      | 5.86    | 3.08   | 4.35      |
| Average Number of Notches Upgraded       | 2.82         | 2.88   | 2.81      | 2.27    | 2.69   | 2.54      |

Across all rating categories, Asia-Pacific structured finance securities were much more stable than US structured finance securities and, with the exception of single-B ratings, all experienced greater frequencies of transitions to higher rating categories in 2007 (Exhibit 34). In addition, only the single-B rating category experienced any transitions to Caa and below.

**Exhibit 34: Asia-Pacific and US Structured Finance 12-month Rating Transition Matrices for 2007**

| Asia-Pacific in 2007 | Aaa     | Aa     | A      | Baa    | Ba     | B      | Caa and below |
|----------------------|---------|--------|--------|--------|--------|--------|---------------|
| Aaa                  | 100.00% |        |        |        |        |        |               |
| Aa                   | 4.78%   | 94.50% | 0.48%  |        | 0.24%  |        |               |
| A                    | 5.93%   | 7.51%  | 84.98% | 1.19%  | 0.40%  |        |               |
| Baa                  | 2.97%   | 0.50%  | 3.47%  | 91.09% | 1.49%  | 0.50%  |               |
| Ba                   |         | 1.35%  |        | 4.05%  | 93.24% | 1.35%  |               |
| B                    |         |        |        |        |        | 92.31% | 7.69%         |
| Caa and below        |         |        |        |        |        |        |               |
| US in 2007           | Aaa     | Aa     | A      | Baa    | Ba     | B      | Caa and below |
| Aaa                  | 99.59%  | 0.18%  | 0.08%  | 0.06%  | 0.05%  | 0.03%  | 0.02%         |
| Aa                   | 3.65%   | 93.66% | 0.74%  | 0.67%  | 0.52%  | 0.24%  | 0.52%         |
| A                    | 0.61%   | 3.18%  | 80.56% | 7.85%  | 4.25%  | 1.76%  | 1.80%         |
| Baa                  | 0.34%   | 0.19%  | 1.81%  | 73.40% | 7.74%  | 8.35%  | 8.17%         |
| Ba                   | 0.15%   | 0.08%  | 0.18%  | 1.58%  | 73.39% | 6.53%  | 18.10%        |
| B                    | 0.14%   |        | 0.07%  | 0.22%  | 1.23%  | 91.74% | 6.59%         |
| Caa and below        |         |        |        | 0.09%  | 0.18%  | 0.54%  | 99.19%        |

## Latin America and US Rating Transitions

The rating drift was decidedly positive in 2007 for the Latin American structured finance market as the region experienced 37 upgrades from 31 deals and only 2 downgrades from 2 deals. Both downgraded tranches were residential mortgage-backed securities, one of which was downgraded due to the cancellation of the financial guarantee, and the other because of the poor performance of the collateral portfolio. 35 of the 37 upgrades affected ABS and the remaining 2 involved RMBS transactions. All the upgrades were primarily attributable to upgrades of related third parties.

The Latin American 12-month downgrade rate experienced the opposite trend as the US downgrade rate, falling from 3.2% in 2006 to 0.8% in 2007 (Exhibit 35). Similar to the US, however, the average size of downgrades doubled from 2 notches to 4 notches. After reaching a historical high of 21.0% in 2006, the upgrade rate dropped to a still high 10.6% in 2007. At the same time, the magnitude of Latin American upgrades increased by half a notch from 1.7 notches to 2.3 notches.

### Exhibit 35: Comparison of Rating Transition Trends for Latin America and US Structured Finance

Exhibit 35A: 12-month Downgrade Rates

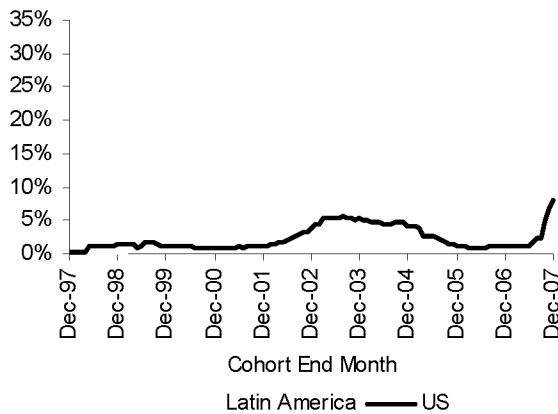


Exhibit 35B: Average Number of Notches Downgraded

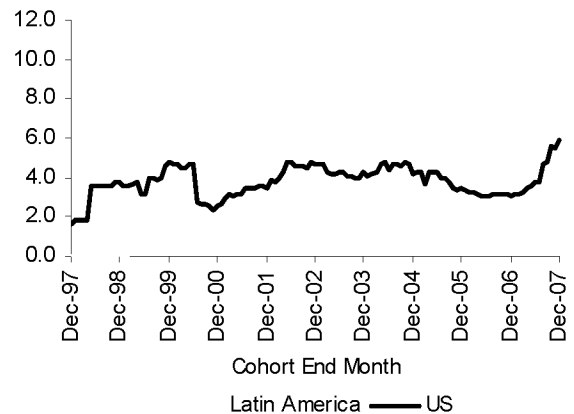


Exhibit 35C: 12-month Upgrade Rates

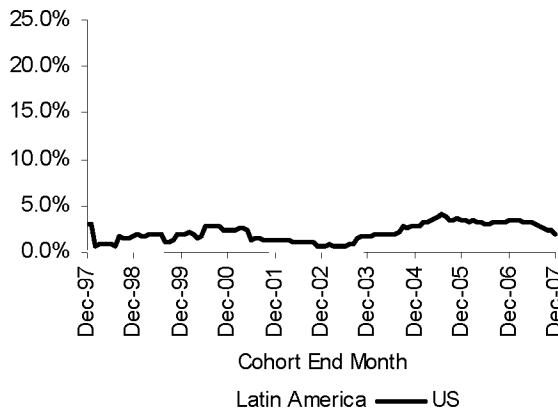
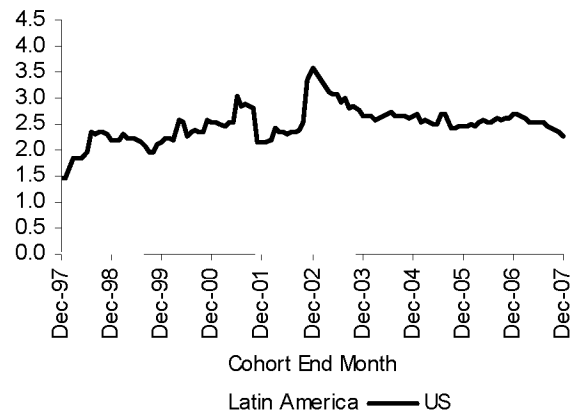


Exhibit 35D: Average Number of Notches Upgraded



**Exhibit 35E: Summary of Rating Transition Trends**

|  | Latin America |        |           | US      |        |           |
|--|---------------|--------|-----------|---------|--------|-----------|
|  | 2007          | 2006   | 1998-2007 | 2007    | 2006   | 1998-2007 |
| Downgrade Rate                           | 0.76%         | 3.23%  | 7.47%     | 8.10%   | 1.18%  | 2.62%     |
| Upgrade Rate                             | 10.61%        | 20.97% | 6.05%     | 2.04%   | 3.52%  | 2.45%     |
| Downgrade/Upgrade Ratio                  | 0.07          | 0.15   | 1.23      | 3.98    | 0.33   | 1.07      |
| Downgrade Rate (Notch Weighted)          | 3.03%         | 6.45%  | 31.01%    | 47.43%  | 3.64%  | 11.38%    |
| Upgrade Rate (Notch Weighted)            | 23.86%        | 36.56% | 13.40%    | 4.61%   | 9.46%  | 6.21%     |
| Downgrade/Upgrade Ratio (Notch Weighted) | 0.13          | 0.18   | 2.31      | 10.28   | 0.38   | 1.83      |
| Rating Drift (Notch Weighted)            | 20.83%        | 30.11% | -17.61%   | -42.82% | 5.82%  | -5.17%    |
| Rating Volatility (Notch Weighted)       | 26.89%        | 43.01% | 44.41%    | 52.05%  | 13.09% | 17.60%    |
| Stability Rate                           | 88.64%        | 75.81% | 86.49%    | 89.86%  | 95.30% | 94.93%    |
| Average Number of Notches Downgraded     | 4.00          | 2.00   | 4.15      | 5.86    | 3.08   | 4.35      |
| Average Number of Notches Upgraded       | 2.25          | 1.74   | 2.22      | 2.27    | 2.69   | 2.54      |

For the Latin American structured finance market in 2007, only the Aaa rating category experienced a negative migration that crossed a broad rating category and again, this was caused by the removal of a financial guarantee policy (Exhibit 36). All other rating categories experienced positive rating migrations and/or no negative transitions that traversed a broad category.

**Exhibit 36: Latin America and US Structured Finance 12-month Rating Transition Matrices for 2007**

| Latin America in 2007 | Aaa    | Aa      | A       | Baa    | Ba      | B      | Caa and below |
|-----------------------|--------|---------|---------|--------|---------|--------|---------------|
| Aaa                   | 98.48% |         |         | 1.52%  |         |        |               |
| Aa                    |        | 100.00% |         |        |         |        |               |
| A                     |        |         | 100.00% |        |         |        |               |
| Baa                   |        |         | 13.59%  | 86.41% |         |        |               |
| Ba                    |        |         |         |        | 100.00% |        |               |
| B                     |        |         |         |        | 24.00%  | 76.00% |               |
| Caa and below         |        |         |         |        |         |        | 100.00%       |

| US in 2007    | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below |
|---------------|--------|--------|--------|--------|--------|--------|---------------|
| Aaa           | 99.59% | 0.18%  | 0.08%  | 0.06%  | 0.05%  | 0.03%  | 0.02%         |
| Aa            | 3.65%  | 93.66% | 0.74%  | 0.67%  | 0.52%  | 0.24%  | 0.52%         |
| A             | 0.61%  | 3.18%  | 80.56% | 7.85%  | 4.25%  | 1.76%  | 1.80%         |
| Baa           | 0.34%  | 0.19%  | 1.81%  | 73.40% | 7.74%  | 8.35%  | 8.17%         |
| Ba            | 0.15%  | 0.08%  | 0.18%  | 1.58%  | 73.39% | 6.53%  | 18.10%        |
| B             | 0.14%  |        | 0.07%  | 0.22%  | 1.23%  | 91.74% | 6.59%         |
| Caa and below |        |        |        | 0.09%  | 0.18%  | 0.54%  | 99.19%        |

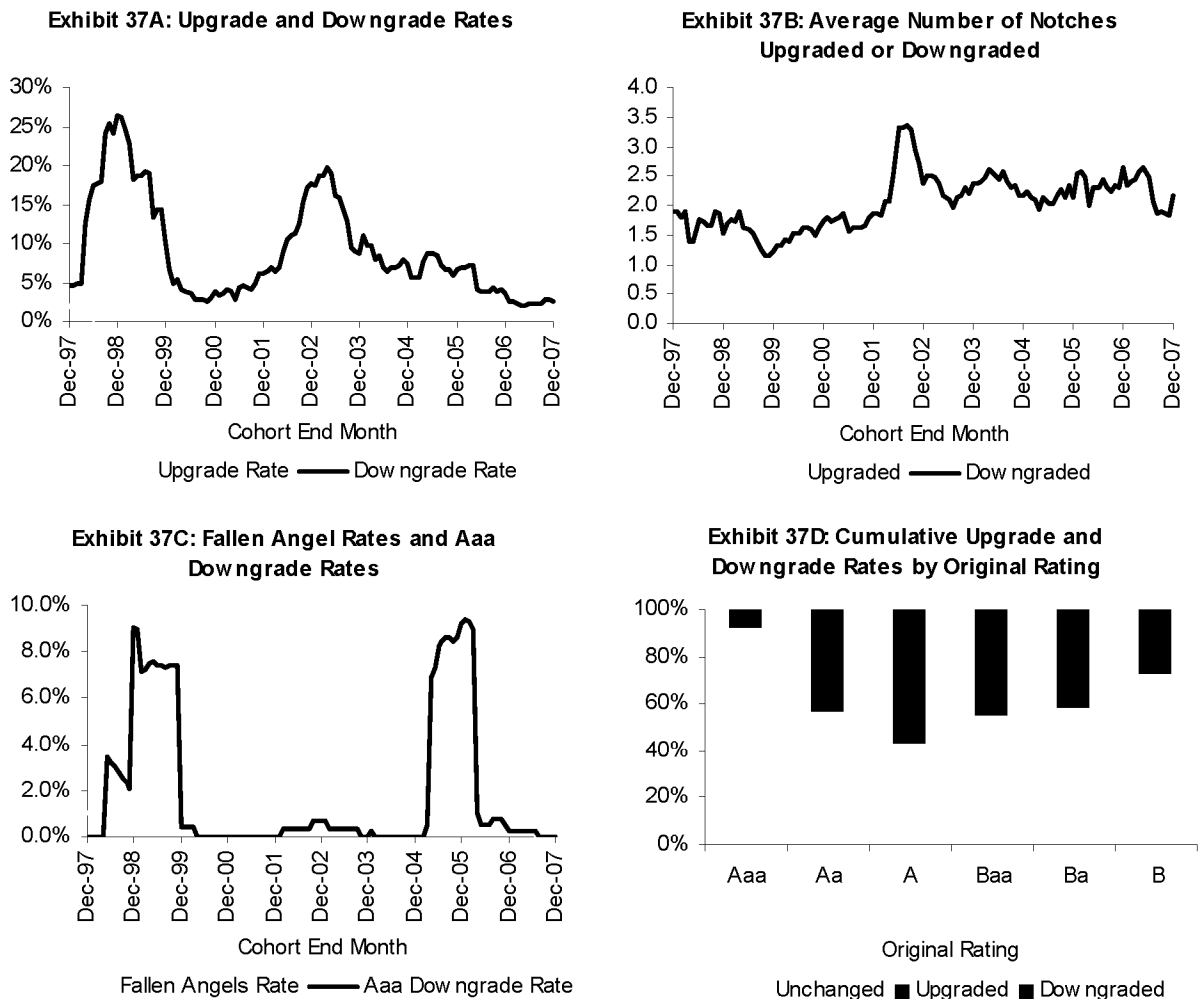


## Rating Transitions in the Derivatives Sector

Unlike the global structured finance sector, the derivatives sector<sup>21</sup> experienced many more positive than negative rating changes in 2007. In total, 53 ratings from 42 deals were downgraded and 206 ratings from 185 deals were upgraded. Since structured notes and repackaged securities made up 68% and 30%, respectively, of the ratings outstanding at the beginning of the year for this sector, it is not surprising that rating changes were concentrated in these two asset types. Structured notes comprised 74% of downgrades and 22% of upgrades and repackaged securities made up 26% of upgrades and 78% of downgrades. All rating changes were caused by changes in the rating of the underlying reference credit. In particular, many of the positive rating actions taken against the repackaged securities were due to Moody's upgrade of the Japanese government's rating for domestic debt securities (JGBs) to A1 from A2 in October 2007.

The 12-month downgrade rate in 2007 dropped to a 7-year low of 2.7%, down 23% from the rate of 3.5% in 2006 (Exhibit 37). The 12-month upgrade rate climbed to a 6-year high of 10.4%, more than 2.5 times higher the upgrade of 3.9% one year ago. Both the average size of rating downgrades and upgrades decreased in 2007 relative to 2006, falling almost half a notch for downgrades to 2.2 and slightly more than a notch for upgrades to 1.2 notches.

**Exhibit 37: Global Derivatives Rating Transition Trends**



<sup>21</sup> The composition of the derivatives sector has changed from previous transition studies as some of the asset types that were included in this sector have now been shifted to the "Other Structured Finance" category and are included in the global structured finance statistics. Please see the description of the data sample and glossary in the Appendix for more details.

**Exhibit 37E: Summary of Rating Transition Trends**

|  | 2007   | 2006   | 1998-2007 | 1998-2006 |
|--|--------|--------|-----------|-----------|
| Downgrade Rate                           | 2.65%  | 3.46%  | 7.60%     | 8.64%     |
| Upgrade Rate                             | 10.37% | 3.86%  | 5.28%     | 5.11%     |
| Downgrade/Upgrade Ratio                  | 0.26   | 0.90   | 1.44      | 1.69      |
| Downgrade Rate (Notch Weighted)          | 5.71%  | 9.12%  | 16.65%    | 18.92%    |
| Upgrade Rate (Notch Weighted)            | 12.90% | 8.99%  | 7.95%     | 7.72%     |
| Downgrade/Upgrade Ratio (Notch Weighted) | 0.44   | 1.01   | 2.09      | 2.45      |
| Rating Drift (Notch Weighted)            | 7.18%  | -0.13% | -8.70%    | -11.19%   |
| Rating Volatility (Notch Weighted)       | 18.61% | 18.11% | 24.60%    | 26.64%    |
| Stability Rate                           | 86.98% | 92.68% | 87.12%    | 86.25%    |
| Average Number of Notches Downgraded     | 2.16   | 2.63   | 2.19      | 2.19      |
| Average Number of Notches Upgraded       | 1.24   | 2.33   | 1.51      | 1.51      |

The frequency of fallen angels and Aaa downgrades were insignificant in 2007. Ratings in the derivatives sector have historically experienced substantially more volatility than those in the global structured finance market, likely reflecting their closer ties to corporate and sovereign ratings which have also historically experienced comparatively higher migration rates.

Because ratings in the derivatives sector are heavily linked to global corporate and sovereign ratings, it is more appropriate to compare derivative rating transitions with corporate rating transitions. In 2007, derivative ratings were more stable than their corporate counterparts across all rating categories (Exhibit 38). Moreover, few rating movements in the derivatives sector crossed more than one broad rating category.

**Exhibit 38: Global Derivatives and Global Corporate Finance 12-month Rating Transition Matrices for 2007**

| Derivatives in 2007 | Aaa     | Aa     | A      | Baa    | Ba     | B      | Caa and below |
|---------------------|---------|--------|--------|--------|--------|--------|---------------|
| Aaa                 | 100.00% |        |        |        |        |        |               |
| Aa                  | 0.30%   | 98.20% | 1.50%  |        |        |        |               |
| A                   |         | 7.13%  | 91.76% | 0.89%  |        | 0.22%  |               |
| Baa                 |         |        | 2.07%  | 95.44% | 1.66%  | 0.83%  |               |
| Ba                  |         |        |        | 1.25%  | 93.75% | 2.50%  | 2.50%         |
| B                   |         |        |        |        |        | 95.38% | 4.62%         |
| Caa and below       |         |        |        |        |        |        | 100.00%       |
| Corporate in 2007   | Aaa     | Aa     | A      | Baa    | Ba     | B      | Caa and below |
| Aaa                 | 95.88%  | 4.12%  |        |        |        |        |               |
| Aa                  | 4.52%   | 91.16% | 4.12%  | 0.10%  |        | 0.10%  |               |
| A                   |         | 9.93%  | 87.27% | 2.62%  | 0.06%  |        | 0.12%         |
| Baa                 |         | 0.19%  | 7.36%  | 88.55% | 3.63%  | 0.28%  |               |
| Ba                  |         |        | 0.19%  | 8.38%  | 83.62% | 7.05%  | 0.76%         |
| B                   | 0.10%   |        |        | 0.20%  | 6.30%  | 83.84% | 9.55%         |
| Caa and below       |         |        |        |        |        | 15.98% | 84.02%        |

## Appendix I: Description of Data Sample and Glossary

The data sample used in this report includes all public, 144A, and private tranches with a publishable Moody's long-term global debt rating among global asset-backed securities (ABS), commercial and residential mortgage-backed securities (CMBS and RMBS), collateralized debt obligations (CDOs), and other structured finance, including asset backed commercial paper (ABCP), structured investment vehicles (SIVs), structured covered bonds, catastrophe bonds, and derivative product companies. Provisional ratings, credit estimates or evaluations, short-term ratings, and national scale ratings are not included. In addition, the following types of securities are excluded from the definition of global structured finance and are analyzed separately in the report: repackaged securities, structured notes, and other credit derivatives which are basically pass-throughs of the rating of another entity.

This data set is an expansion of the data set that was used in prior annual structured finance transition studies. Unlike the data set from previous years, this data sample:

- Includes tranches wrapped by financial guarantors, government agencies, and government sponsored enterprises (GSEs);

- Includes interest-only (IO) and residual tranches;

- Includes some transactions outside of the four major sectors (ABS, CDO, CMBS, RMBS) of structured finance, such as ABCP, SIVs, structured covered bonds, catastrophe bonds and derivative product companies;

- Does not collapse tranches with the same rating from the same deal, i.e. all pari-passu tranches are counted in the data sample. The exceptions to this are notes with the same rating issued out of the same program for ABCP, SIVs and structured covered bonds, in which case only the rating of the program and not each individual security is counted.

The corporate data set used to compare corporate rating transitions to structured finance rating transitions includes international corporate and sovereign issuers, but excludes US municipal ratings.

*The data used to create this report are commercially available via Moody's Structured Finance Default Risk service and Moody's Corporate Default Risk service. For more information, please email [DefaultResearch@moodys.com](mailto:DefaultResearch@moodys.com).*

## Glossary

### Broad Ratings and Refined Ratings

Broad ratings refer to the following Moody's long-term bond rating categories: Aaa, Aa, A, Baa, Ba, B, and Caa and below. Refined ratings or ratings with numeric modifiers refer to Aaa, Aa1, Aa2, Aa3, A1, A2, A3, Baa1, Baa2, Baa3, Ba1, Ba2, Ba3, B1, B2, B3, Caa1, Caa2, Caa3, Ca, and C. The broad rating category Caa and below includes the following refined ratings: Caa1, Caa2, Caa3, Ca, and C.

### Investment-Grade (IG) and Below Investment-Grade (BIG)/Speculative-Grade (SG) Ratings

Investment-grade ratings refer to Aaa, Aa1, Aa2, Aa3, A1, A2, A3, Baa1, Baa2, and Baa3. Below investment-grade or speculative-grade ratings refer to Ba1, Ba2, Ba3, B1, B2, B3, Caa1, Caa2, Caa3, Ca, and C.

### Downgrade (Upgrade) Rate

A security is considered to have been downgraded (upgraded) if its rating at the end of a pre-specified time period is lower (higher) than at the beginning of the time period on the basis of ratings with numeric modifiers (also known as refined ratings or modified ratings). The downgrade rate is the number of securities downgraded (or upgraded) divided by the total number of outstanding securities at the beginning of the time period. Note that in measuring downgrade rates and upgrade rates, only ratings at the beginning and the end of the time period are considered. However, if a rating was withdrawn by the end of the time period, then the rating prior to withdrawal is used as the end rating. Note that a security will only be counted if it was outstanding as of the cohort formation date.

## **Average Number of Total Notches Downgraded (Upgraded) per 12-month Cohort**

The number of total notches downgraded (upgraded) per 12-month cohort for a downgraded (upgraded) security is the difference in the rating of that security at the beginning and end of a 12-month period based on refined ratings. This term is also referred to as the magnitude, size, or severity of the rating change. The average number of total notches downgraded (upgraded) per 12-month cohort averages this quantity for all downgraded (upgraded) securities over the 12-month period. A security can experience multiple rating actions during a 12-month period, and therefore, this measure is different from the average number of notches changed per rating action. For example, if a security is downgraded from Baa1 to Baa2 and then Baa2 to Baa3 over 12 months, then the average number of notches changed per rating action would be one, but the average number of total notches changed per 12-month cohort would be two.

## **Weighted Downgrade (Upgrade) Rate**

The weighted downgrade (upgrade) rate is computed as the number of securities downgraded (upgraded), weighted by the number of total notches changed per downgrade (upgrade) per year, divided by the total number of outstanding securities at the beginning of the 12-month period. For example, a security downgraded from Baa1 to B1 over 12 months is counted as three downgrades in the calculation of a weighted downgrade rate, but counted as only one downgrade in the calculation of the unweighted downgrade rate.

## **Fallen Angel Rate**

A fallen angel is a security that was downgraded from an investment-grade rating to a below investment-grade rating. The fallen angel rate is the number of such securities over a 12-month period divided by the total number of investment grade securities outstanding at the beginning of the 12-month period. Note that a security will only be counted if it was outstanding as of the cohort formation date.

## **Cumulative Downgrade (Upgrade) Rate**

A security is considered to have experienced a cumulative or lifetime downgrade (upgrade), if its rating before withdrawal or rating at the end of the study period is lower (higher) than its original rating. The cumulative downgrade (upgrade) rate for a particular group of securities is computed as the number of securities to experience a cumulative downgrade (upgrade) divided by the total number of securities in the group.

## **Downgrade-to-Upgrade Ratio (weighted)**

The downgrade-to-upgrade ratio is calculated as the total number of downgraded ratings divided by the total number of upgraded ratings. The weighted downgrade-to-upgrade ratio is the number of downgraded ratings, weighted by the number of notches changed, divided by the number of upgraded ratings, weighted by the number of notches changed.

## **Rating Drift**

The rating drift is defined as the weighted upgrade rate minus the weighted downgrade rate.

## **Rating Volatility**

The rating volatility is defined as the weighted upgrade rate plus the weighted downgrade rate.

## **Rating Stability Rate**

The rating stability rate is a measure of the proportion of ratings that were unchanged over a pre-specified time period. It is calculated as one minus the sum of the downgrade rate and upgrade rate.

## **ABS**

ABS stand for asset-backed securities. This structured finance sector includes securities backed by home equity loans (HEL) and both traditional asset types such as auto loans, credit card receivables, student loans, and

manufactured housing loans, and non-traditional asset types such as mutual fund fees, tax liens, tobacco settlement payments, and intellectual property.

## **HEL**

The home equity loan or HEL sector includes securities backed by subprime (B&C) mortgage loans, home improvement loans, high loan-to-value (high LTV) loans, home equity lines of credit (HELOCs), and closed-end second-lien loans, as well as net interest margin (NIM) securitizations. It does not include securities backed by Alt-A mortgages, which are included in the RMBS sector. HEL is part of the ABS sector.

Prior to 1998, RMBS collateral was generally defined as first-lien residential mortgages, regardless of the credit quality of the borrower. HEL collateral generally included junior liens such as HELOCs or closed-end seconds. However, as subprime lending became more prevalent, the market shifted its definition such that HEL encompassed subprime first-lien residential mortgages while RMBS included first-lien mortgages made to higher quality borrowers. Since 1998, a deal classified as RMBS by Moody's is generally backed by prime or Alt-A quality first-lien residential mortgages, while a deal classified as HEL is generally backed by subprime first-lien mortgages or junior liens. Therefore, a subprime deal which would be classified as HEL today may have been classified as RMBS in the past.

## **CDOs**

CDOs stand for collateralized debt obligations. Derivative securities such as structured notes and repackaged securities are not considered to be part of this sector. Commercial real estate (CRE) CDOs, where 70% or more of the collateral is comprised of CRE loans, are classified as CMBS. If the collateral backing the transaction contains less than 70% CRE loans, then the deal is classified as a CDO.

## **CMBS**

CMBS stand for commercial mortgage-backed securities. Commercial real estate (CRE) CDOs, where 70% or more of the collateral is comprised of CRE loans, are classified as CMBS. If the collateral backing the transaction contains less than 70% CRE loans, then the deal is classified as a CDO.

## **RMBS**

RMBS stand for residential mortgage-backed securities. The vast majority of these securities are backed by first-lien prime mortgages or by Alt-A mortgages. For further details, see the definition of HEL.

## **Other Structured Finance**

Other structured finance consists of structured finance securities not categorized in the four major sectors (ABS, CDO, CMBS, and RMBS) including asset-backed commercial paper (ABCP) programs, structured investment vehicles (SIVs), structured covered bonds, insurance-linked securities such as catastrophe bonds, and derivative product companies. However, notes carrying only short-term ratings such as commercial paper are excluded.

## **Global Structured Finance**

Global structured finance captures securities issued around the world in the four major sectors - ABS, CDO, CMBS, and RMBS – and in the other structured finance category. For further details, see the definition of Other Structured Finance.

## **US Structured Finance**

US structured finance securities are denominated in US dollars and issued in the US market or denominated in Canadian dollars and issued in Canada. In cases where the source of the underlying collateral and the denomination of the securities cross multiple countries/regions, deals are classified by the location at which they are monitored.

## **EMEA Structured Finance**

EMEA is an abbreviation of Europe, the Middle East, and Africa. EMEA structured finance securities are denominated in a currency from or issued out of a country in the EMEA region. In cases where the source of the underlying collateral and the denomination of the securities cross multiple countries/regions, deals are classified by the location at which they are monitored.

## **Asia-Pacific Structured Finance**

Asia-Pacific structured finance securities are denominated in the currency of a country in the Asia-Pacific region or issued in an Asia-Pacific country (including Japan and Australia). In cases where the source of the underlying collateral and the denomination of the securities cross multiple countries/regions, deals are classified by the location at which they are monitored

## **Latin American Structured Finance**

Latin American structured finance securities are denominated in a Latin American currency or issued in Latin America. In cases where the source of the underlying collateral and the denomination of the securities cross multiple countries/regions, deals are classified by the location at which they are monitored.

## **Global Derivatives**

The derivatives sector contains structured notes, repackaged securities, and other credit derivatives which are basically pass-throughs of the rating of another entity.

## Appendix II: Methodology

### Computation of Rating Transition Statistics

Rating transition statistics can be reported by cohort rating or by original rating. For statistics calculated by cohort rating, every month the rating migrations of all outstanding securities are tracked over a pre-specified time period regardless of when the security was issued. For statistics calculated by original rating, every month the rating migration of all securities issued in that month are tracked over a pre-specified time period, in which case each security carries its original rating at the start of the period.

Unless otherwise stated, transition statistics in the report are calculated by cohort rating and usually the pre-specified time period is one year, although multi-year statistics are also reported. In any case, the rating (including WR) must exist over the entire time period in order to be counted, e.g. a rating must be seasoned at least three years to be counted in a three-year downgrade rate, and only the rating outstanding at the beginning and end of the time period are used.

All average transition statistics (downgrade rates, upgrade rates, transition matrices, etc.) are calculated by averaging over the rates calculated on a monthly basis, where each month's contribution to the total is weighted by the number of ratings used in that month's computation. For example, the average 12-month downgrade rate over 1998 to 2007 is calculated by taking a weighted average of the 12-month downgrade rates of all cohorts in that 10-year period, starting from the cohort ending December 1998 and ending with the cohort ending December 2007.

### Counting Downgrades and Upgrades

Within the main body of the report, a downgrade (upgrade) of a security is counted if its rating at the end of a pre-specified time period or immediately prior to withdrawal, if the rating had been withdrawn during the time period, is lower (higher) than at the beginning of the time period.<sup>22</sup>

Note that, if a security is downgraded (upgraded) multiple times over the period under consideration, this will still be counted as one downgrade (upgrade). Moreover, if a tranche is downgraded and then upgraded (or upgraded and then downgraded) so that its start rating and end rating are the same, then no rating change will be considered as having occurred and neither the downgrade nor the upgrade will be counted.

When reporting the absolute number of downgrades (upgrades), all rating changes that occurred during the year under the above definition are counted, regardless of when the rating was issued. In contrast, transition statistics by cohort rating only consider changes to ratings that were outstanding as of the cohort formation date. In particular, if a security was issued in 2007 and downgraded in the same year, then it would not be counted in the 12-month downgrade rate by cohort rating for 2007 because it had not been outstanding as of 1/1/07. This is true of both the transition statistics presented in the main body of the text and the transition matrices in Appendix III.

In addition, the rating transition matrices in Appendix III show the migration to WR rather than the rating just prior to withdrawal. For those who are interested in rating changes prior to withdrawal, some information is provided in the bottom-most transition matrix for the 5-year transition matrices by original rating in Appendix III.

Below is an excerpt from the transition matrix for withdrawn securities for the 5-yr cohort by original rating for global structured finance. The universe of securities under consideration in this row are those that were originally rated Aa, seasoned at least 5 years, and had WR ratings 5 years after issuance. For these tranches, 71.64% were still rated Aa immediately before withdrawal, 21.48% had been upgraded to Aaa, 3.52% had been downgraded to single-A, 1.84% had been downgraded to Baa, etc..

Sample Row from a Transition Matrix of Ratings prior to WR

| Original Rating | Rating before WR |        |       |       |       |       |               |
|-----------------|------------------|--------|-------|-------|-------|-------|---------------|
|                 | Aaa              | Aa     | A     | Baa   | Ba    | B     | Caa and below |
| Aa              | 21.48%           | 71.64% | 3.52% | 1.84% | 0.27% | 0.22% | 1.03%         |

<sup>22</sup> This differs from how withdrawals were treated in previous transition studies when rating changes prior to WR were not counted. In the structured finance transition studies published between 2005 and 2007, half the withdrawn ratings were deducted from the population, and in 2003 and 2004, all withdrawn ratings were deducted from the population.

## Appendix III: Multi-Year Horizon Transition Matrices

### Matrices by Cohort Rating

| 1-year        | Aaa           | Aa            | A             | Baa           | Ba            | B             | Caa and below | WR     |
|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|--------|
| Aaa           | <b>85.54%</b> | 0.23%         | 0.06%         | 0.02%         | 0.01%         | 0.01%         | 0.01%         | 14.11% |
| Aa            | 5.66%         | <b>84.23%</b> | 1.46%         | 0.43%         | 0.11%         | 0.08%         | 0.12%         | 7.92%  |
| A             | 1.13%         | 3.52%         | <b>84.63%</b> | 2.23%         | 0.62%         | 0.24%         | 0.23%         | 7.40%  |
| Baa           | 0.34%         | 0.51%         | 2.70%         | <b>84.77%</b> | 2.65%         | 1.42%         | 1.27%         | 6.34%  |
| Ba            | 0.13%         | 0.08%         | 0.47%         | 2.77%         | <b>82.76%</b> | 3.27%         | 4.46%         | 6.06%  |
| B             | 0.05%         | 0.03%         | 0.08%         | 0.34%         | 2.03%         | <b>82.24%</b> | 9.53%         | 5.70%  |
| Caa and below | 0.03%         | 0.00%         | 0.00%         | 0.06%         | 0.11%         | 0.61%         | <b>90.14%</b> | 9.06%  |

| 2-year        | Aaa           | Aa            | A             | Baa           | Ba            | B             | Caa and below | WR     |
|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|--------|
| Aaa           | <b>70.16%</b> | 0.36%         | 0.13%         | 0.06%         | 0.03%         | 0.02%         | 0.03%         | 29.20% |
| Aa            | 10.56%        | <b>66.72%</b> | 2.29%         | 1.06%         | 0.33%         | 0.21%         | 0.33%         | 18.51% |
| A             | 2.62%         | 5.79%         | <b>69.00%</b> | 2.88%         | 1.07%         | 0.40%         | 0.63%         | 17.62% |
| Baa           | 0.87%         | 1.25%         | 4.87%         | <b>69.50%</b> | 3.63%         | 1.97%         | 2.72%         | 15.18% |
| Ba            | 0.23%         | 0.23%         | 1.28%         | 4.75%         | <b>67.60%</b> | 4.24%         | 7.69%         | 13.97% |
| B             | 0.07%         | 0.06%         | 0.20%         | 0.72%         | 3.55%         | <b>67.53%</b> | 15.59%        | 12.29% |
| Caa and below | 0.02%         | 0.00%         | 0.00%         | 0.10%         | 0.26%         | 0.93%         | <b>80.31%</b> | 18.37% |

| 3-year        | Aaa           | Aa            | A             | Baa           | Ba            | B             | Caa and below | WR     |
|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|--------|
| Aaa           | <b>56.43%</b> | 0.42%         | 0.19%         | 0.10%         | 0.05%         | 0.05%         | 0.06%         | 42.69% |
| Aa            | 14.02%        | <b>50.29%</b> | 2.78%         | 1.60%         | 0.62%         | 0.43%         | 0.61%         | 29.64% |
| A             | 3.71%         | 6.85%         | <b>53.20%</b> | 3.19%         | 1.58%         | 0.62%         | 1.29%         | 29.56% |
| Baa           | 1.43%         | 1.80%         | 6.21%         | <b>52.78%</b> | 4.38%         | 2.70%         | 5.30%         | 25.39% |
| Ba            | 0.34%         | 0.44%         | 1.97%         | 5.79%         | <b>52.38%</b> | 4.62%         | 11.82%        | 22.64% |
| B             | 0.11%         | 0.07%         | 0.24%         | 1.03%         | 3.94%         | <b>54.02%</b> | 20.89%        | 19.69% |
| Caa and below | 0.00%         | 0.00%         | 0.01%         | 0.19%         | 0.33%         | 0.78%         | <b>70.98%</b> | 27.71% |

| 4-year        | Aaa           | Aa            | A             | Baa           | Ba            | B             | Caa and below | WR     |
|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|--------|
| Aaa           | <b>45.18%</b> | 0.40%         | 0.23%         | 0.13%         | 0.07%         | 0.07%         | 0.10%         | 53.81% |
| Aa            | 15.63%        | <b>37.63%</b> | 2.83%         | 1.76%         | 0.70%         | 0.61%         | 0.94%         | 39.91% |
| A             | 4.38%         | 6.63%         | <b>40.80%</b> | 3.01%         | 1.82%         | 0.71%         | 1.95%         | 40.71% |
| Baa           | 1.96%         | 2.13%         | 6.48%         | <b>39.72%</b> | 4.48%         | 2.92%         | 7.79%         | 34.52% |
| Ba            | 0.46%         | 0.55%         | 2.33%         | 6.16%         | <b>40.02%</b> | 4.35%         | 15.17%        | 30.97% |
| B             | 0.12%         | 0.02%         | 0.23%         | 1.39%         | 3.41%         | <b>43.22%</b> | 23.95%        | 27.66% |
| Caa and below | 0.00%         | 0.00%         | 0.00%         | 0.22%         | 0.31%         | 0.53%         | <b>62.07%</b> | 36.88% |

| 5-year        | Aaa           | Aa            | A             | Baa           | Ba            | B             | Caa and below | WR     |
|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|--------|
| Aaa           | <b>36.63%</b> | 0.35%         | 0.22%         | 0.14%         | 0.08%         | 0.08%         | 0.11%         | 62.39% |
| Aa            | 15.96%        | <b>28.09%</b> | 2.55%         | 1.62%         | 0.59%         | 0.66%         | 1.13%         | 49.40% |
| A             | 4.78%         | 5.91%         | <b>31.61%</b> | 2.40%         | 1.64%         | 0.65%         | 2.22%         | 50.78% |
| Baa           | 2.42%         | 2.30%         | 6.45%         | <b>30.84%</b> | 3.63%         | 2.72%         | 9.77%         | 41.88% |
| Ba            | 0.51%         | 0.66%         | 2.40%         | 6.14%         | <b>30.99%</b> | 3.98%         | 16.96%        | 38.36% |
| B             | 0.22%         | 0.00%         | 0.17%         | 1.69%         | 2.40%         | <b>34.67%</b> | 25.09%        | 35.77% |
| Caa and below | 0.00%         | 0.00%         | 0.00%         | 0.17%         | 0.31%         | 0.52%         | <b>53.80%</b> | 45.20% |



| 1-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR     |
|---------------|--------|--------|--------|--------|--------|--------|---------------|--------|
| Aaa           | 83.31% | 0.28%  | 0.12%  | 0.04%  | 0.03%  | 0.02%  | 0.03%         | 16.17% |
| Aa            | 2.23%  | 87.36% | 2.01%  | 0.75%  | 0.23%  | 0.21%  | 0.36%         | 6.85%  |
| A             | 0.48%  | 2.03%  | 85.50% | 2.86%  | 0.82%  | 0.37%  | 0.35%         | 7.60%  |
| Baa           | 0.15%  | 0.19%  | 1.09%  | 85.44% | 3.73%  | 2.22%  | 2.10%         | 5.08%  |
| Ba            | 0.06%  | 0.05%  | 0.13%  | 1.32%  | 76.09% | 6.18%  | 11.58%        | 4.59%  |
| B             | 0.00%  | 0.00%  | 0.10%  | 0.10%  | 0.21%  | 70.76% | 24.65%        | 4.18%  |
| Caa and below | 0.00%  | 0.00%  | 0.00%  | 0.01%  | 0.04%  | 0.06%  | 90.14%        | 9.73%  |
| 2-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR     |
| Aaa           | 66.74% | 0.44%  | 0.23%  | 0.12%  | 0.08%  | 0.07%  | 0.08%         | 32.24% |
| Aa            | 4.02%  | 71.90% | 3.04%  | 2.04%  | 0.65%  | 0.59%  | 1.07%         | 16.69% |
| A             | 0.98%  | 3.25%  | 70.99% | 3.63%  | 1.32%  | 0.51%  | 0.91%         | 18.41% |
| Baa           | 0.35%  | 0.47%  | 1.88%  | 72.58% | 5.14%  | 2.78%  | 3.89%         | 12.91% |
| Ba            | 0.13%  | 0.16%  | 0.34%  | 1.42%  | 59.44% | 7.02%  | 18.79%        | 12.71% |
| B             | 0.00%  | 0.00%  | 0.25%  | 0.25%  | 0.40%  | 52.55% | 35.45%        | 11.09% |
| Caa and below | 0.00%  | 0.00%  | 0.00%  | 0.02%  | 0.07%  | 0.08%  | 78.98%        | 20.84% |
| 3-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR     |
| Aaa           | 53.34% | 0.52%  | 0.34%  | 0.20%  | 0.13%  | 0.14%  | 0.17%         | 45.15% |
| Aa            | 5.33%  | 55.77% | 3.90%  | 3.38%  | 1.12%  | 1.22%  | 2.02%         | 27.26% |
| A             | 1.15%  | 3.63%  | 55.27% | 4.03%  | 2.09%  | 0.75%  | 1.75%         | 31.33% |
| Baa           | 0.43%  | 0.61%  | 2.32%  | 54.91% | 6.80%  | 4.01%  | 7.94%         | 22.96% |
| Ba            | 0.19%  | 0.34%  | 0.40%  | 1.50%  | 39.96% | 6.37%  | 29.39%        | 21.84% |
| B             | 0.00%  | 0.00%  | 0.50%  | 0.50%  | 0.69%  | 34.87% | 43.36%        | 20.08% |
| Caa and below | 0.00%  | 0.00%  | 0.00%  | 0.03%  | 0.02%  | 0.09%  | 67.34%        | 32.52% |
| 4-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR     |
| Aaa           | 42.97% | 0.53%  | 0.41%  | 0.28%  | 0.17%  | 0.19%  | 0.28%         | 55.17% |
| Aa            | 5.34%  | 43.46% | 4.16%  | 3.94%  | 1.17%  | 1.80%  | 3.06%         | 37.07% |
| A             | 1.15%  | 3.07%  | 43.06% | 3.84%  | 2.51%  | 0.85%  | 2.48%         | 43.05% |
| Baa           | 0.44%  | 0.65%  | 2.00%  | 40.39% | 7.34%  | 4.42%  | 12.60%        | 32.16% |
| Ba            | 0.28%  | 0.45%  | 0.48%  | 1.36%  | 25.22% | 4.65%  | 38.09%        | 29.48% |
| B             | 0.17%  | 0.00%  | 0.65%  | 0.89%  | 1.15%  | 23.36% | 43.17%        | 30.61% |
| Caa and below | 0.00%  | 0.00%  | 0.00%  | 0.05%  | 0.00%  | 0.04%  | 52.66%        | 47.26% |
| 5-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR     |
| Aaa           | 34.43% | 0.51%  | 0.44%  | 0.29%  | 0.18%  | 0.21%  | 0.33%         | 63.62% |
| Aa            | 5.10%  | 34.40% | 3.99%  | 3.87%  | 0.85%  | 2.14%  | 3.62%         | 46.03% |
| A             | 1.28%  | 2.48%  | 34.16% | 2.95%  | 2.23%  | 0.73%  | 2.72%         | 53.45% |
| Baa           | 0.52%  | 0.78%  | 1.91%  | 31.43% | 5.58%  | 3.73%  | 17.11%        | 38.95% |
| Ba            | 0.35%  | 0.43%  | 0.62%  | 1.09%  | 19.32% | 3.63%  | 39.43%        | 35.13% |
| B             | 0.40%  | 0.00%  | 0.57%  | 1.49%  | 1.27%  | 18.06% | 35.67%        | 42.54% |
| Caa and below | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 38.71%        | 61.29% |

| 1-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR     |
|---------------|--------|--------|--------|--------|--------|--------|---------------|--------|
| Aaa           | 84.25% | 0.42%  | 0.20%  | 0.07%  | 0.06%  | 0.03%  | 0.04%         | 14.91% |
| Aa            | 2.56%  | 81.07% | 3.46%  | 1.38%  | 0.44%  | 0.47%  | 0.85%         | 9.78%  |
| A             | 0.70%  | 2.23%  | 81.55% | 3.35%  | 0.71%  | 0.34%  | 0.38%         | 10.73% |
| Baa           | 0.43%  | 0.37%  | 1.53%  | 81.37% | 4.90%  | 1.50%  | 1.96%         | 7.93%  |
| Ba            | 0.16%  | 0.03%  | 0.20%  | 2.21%  | 70.11% | 7.63%  | 12.73%        | 6.93%  |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 70.22% | 26.98%        | 2.80%  |
| Caa and below | 0.00%  | 0.00%  | 0.00%  | 0.02%  | 0.06%  | 0.09%  | 92.96%        | 6.87%  |
| 2-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR     |
| Aaa           | 68.61% | 0.67%  | 0.39%  | 0.21%  | 0.16%  | 0.12%  | 0.11%         | 29.72% |
| Aa            | 3.48%  | 64.60% | 4.02%  | 3.50%  | 1.27%  | 1.16%  | 2.18%         | 19.78% |
| A             | 1.25%  | 2.84%  | 65.75% | 4.05%  | 1.60%  | 0.66%  | 1.19%         | 22.67% |
| Baa           | 0.81%  | 0.80%  | 1.97%  | 65.21% | 6.48%  | 2.54%  | 5.08%         | 17.10% |
| Ba            | 0.26%  | 0.11%  | 0.36%  | 1.52%  | 47.99% | 8.64%  | 26.12%        | 15.01% |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 50.51% | 43.04%        | 6.45%  |
| Caa and below | 0.00%  | 0.00%  | 0.00%  | 0.03%  | 0.11%  | 0.12%  | 84.79%        | 14.95% |
| 3-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR     |
| Aaa           | 54.63% | 0.72%  | 0.55%  | 0.35%  | 0.22%  | 0.25%  | 0.23%         | 43.04% |
| Aa            | 3.88%  | 50.85% | 4.04%  | 4.87%  | 1.77%  | 2.05%  | 3.47%         | 29.07% |
| A             | 1.23%  | 2.61%  | 52.08% | 3.76%  | 2.26%  | 0.83%  | 2.05%         | 35.18% |
| Baa           | 0.82%  | 0.74%  | 1.69%  | 50.69% | 7.23%  | 3.33%  | 9.05%         | 26.44% |
| Ba            | 0.35%  | 0.23%  | 0.21%  | 0.90%  | 29.71% | 7.20%  | 39.74%        | 21.67% |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 30.20% | 58.55%        | 11.25% |
| Caa and below | 0.00%  | 0.00%  | 0.00%  | 0.05%  | 0.03%  | 0.14%  | 75.49%        | 24.29% |
| 4-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR     |
| Aaa           | 43.68% | 0.66%  | 0.65%  | 0.48%  | 0.29%  | 0.34%  | 0.37%         | 53.53% |
| Aa            | 4.22%  | 40.23% | 3.44%  | 4.90%  | 1.67%  | 2.79%  | 4.65%         | 38.10% |
| A             | 1.07%  | 2.21%  | 41.69% | 3.12%  | 2.50%  | 0.82%  | 2.77%         | 45.81% |
| Baa           | 0.73%  | 0.64%  | 1.30%  | 39.77% | 7.44%  | 3.61%  | 13.27%        | 33.24% |
| Ba            | 0.40%  | 0.34%  | 0.05%  | 0.72%  | 13.75% | 4.05%  | 53.38%        | 27.31% |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 16.83% | 65.24%        | 17.93% |
| Caa and below | 0.00%  | 0.00%  | 0.00%  | 0.10%  | 0.00%  | 0.08%  | 60.43%        | 39.40% |
| 5-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR     |
| Aaa           | 35.41% | 0.57%  | 0.67%  | 0.50%  | 0.31%  | 0.38%  | 0.44%         | 61.72% |
| Aa            | 4.44%  | 32.64% | 2.83%  | 4.13%  | 1.08%  | 3.13%  | 5.02%         | 46.72% |
| A             | 1.15%  | 1.96%  | 33.79% | 2.05%  | 2.14%  | 0.60%  | 2.86%         | 55.45% |
| Baa           | 0.81%  | 0.77%  | 1.16%  | 31.73% | 5.27%  | 3.58%  | 17.92%        | 38.76% |
| Ba            | 0.50%  | 0.43%  | 0.00%  | 0.72%  | 9.92%  | 2.10%  | 54.82%        | 31.50% |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 15.99% | 55.71%        | 28.30% |
| Caa and below | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 43.25%        | 56.75% |

| 1-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR     |
|---------------|--------|--------|--------|--------|--------|--------|---------------|--------|
| Aaa           | 82.34% | 0.13%  | 0.03%  | 0.01%  | 0.00%  | 0.00%  | 0.01%         | 17.47% |
| Aa            | 2.02%  | 91.46% | 1.06%  | 0.34%  | 0.09%  | 0.04%  | 0.04%         | 4.94%  |
| A             | 0.20%  | 1.78%  | 90.45% | 2.24%  | 0.95%  | 0.41%  | 0.31%         | 3.65%  |
| Baa           | 0.02%  | 0.11%  | 0.89%  | 87.33% | 3.18%  | 2.55%  | 2.16%         | 3.75%  |
| Ba            | 0.00%  | 0.07%  | 0.09%  | 0.77%  | 79.80% | 5.28%  | 10.86%        | 3.15%  |
| B             | 0.00%  | 0.00%  | 0.25%  | 0.25%  | 0.54%  | 71.58% | 21.16%        | 6.23%  |
| Caa and below | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 82.92%        | 17.08% |
| 2-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR     |
| Aaa           | 64.62% | 0.18%  | 0.05%  | 0.01%  | 0.00%  | 0.00%  | 0.05%         | 35.08% |
| Aa            | 4.53%  | 78.77% | 2.11%  | 0.65%  | 0.07%  | 0.06%  | 0.02%         | 13.78% |
| A             | 0.47%  | 4.01%  | 80.66% | 2.85%  | 0.82%  | 0.25%  | 0.39%         | 10.54% |
| Baa           | 0.05%  | 0.25%  | 1.82%  | 77.25% | 4.29%  | 2.93%  | 3.14%         | 10.26% |
| Ba            | 0.00%  | 0.20%  | 0.32%  | 1.33%  | 70.53% | 5.45%  | 11.69%        | 10.48% |
| B             | 0.00%  | 0.00%  | 0.62%  | 0.62%  | 0.99%  | 55.53% | 24.42%        | 17.83% |
| Caa and below | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 66.36%        | 33.64% |
| 3-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR     |
| Aaa           | 51.77% | 0.28%  | 0.08%  | 0.02%  | 0.01%  | 0.00%  | 0.11%         | 47.73% |
| Aa            | 7.25%  | 62.25% | 3.71%  | 1.41%  | 0.25%  | 0.14%  | 0.10%         | 24.90% |
| A             | 0.95%  | 6.36%  | 63.77% | 4.76%  | 1.65%  | 0.54%  | 0.94%         | 21.03% |
| Baa           | 0.09%  | 0.50%  | 2.87%  | 58.57% | 6.44%  | 4.59%  | 6.99%         | 19.95% |
| Ba            | 0.00%  | 0.46%  | 0.65%  | 2.27%  | 52.97% | 5.31%  | 16.28%        | 22.05% |
| B             | 0.00%  | 0.00%  | 1.11%  | 1.11%  | 1.54%  | 40.56% | 24.85%        | 30.84% |
| Caa and below | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 54.33%        | 45.67% |
| 4-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR     |
| Aaa           | 42.06% | 0.36%  | 0.10%  | 0.02%  | 0.01%  | 0.00%  | 0.17%         | 57.28% |
| Aa            | 7.27%  | 48.89% | 5.38%  | 2.30%  | 0.32%  | 0.12%  | 0.36%         | 35.37% |
| A             | 1.43%  | 6.25%  | 47.96% | 6.48%  | 2.55%  | 0.93%  | 1.42%         | 32.97% |
| Baa           | 0.12%  | 0.66%  | 2.79%  | 41.09% | 7.23%  | 5.35%  | 11.83%        | 30.93% |
| Ba            | 0.13%  | 0.58%  | 1.02%  | 2.17%  | 39.68% | 5.40%  | 18.80%        | 32.21% |
| B             | 0.32%  | 0.00%  | 1.23%  | 1.69%  | 2.18%  | 29.22% | 23.37%        | 41.99% |
| Caa and below | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 45.36%        | 54.64% |
| 5-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR     |
| Aaa           | 33.15% | 0.44%  | 0.13%  | 0.02%  | 0.00%  | 0.00%  | 0.18%         | 66.08% |
| Aa            | 6.49%  | 37.90% | 6.41%  | 3.35%  | 0.36%  | 0.09%  | 0.73%         | 44.68% |
| A             | 1.84%  | 4.78%  | 35.71% | 7.05%  | 2.65%  | 1.32%  | 2.12%         | 44.53% |
| Baa           | 0.13%  | 0.79%  | 2.92%  | 31.03% | 6.00%  | 3.92%  | 16.01%        | 39.20% |
| Ba            | 0.16%  | 0.42%  | 1.40%  | 1.56%  | 31.19% | 5.57%  | 19.98%        | 39.72% |
| B             | 0.66%  | 0.00%  | 0.94%  | 2.46%  | 2.09%  | 19.39% | 22.71%        | 51.74% |
| Caa and below | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 36.52%        | 63.48% |

| 1-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR     |
|---------------|--------|--------|--------|--------|--------|--------|---------------|--------|
| Aaa           | 86.44% | 0.10%  | 0.02%  | 0.00%  | 0.00%  | 0.00%  | 0.00%         | 13.44% |
| Aa            | 7.27%  | 83.38% | 0.89%  | 0.15%  | 0.01%  | 0.00%  | 0.01%         | 8.30%  |
| A             | 1.43%  | 5.16%  | 84.23% | 1.59%  | 0.34%  | 0.08%  | 0.07%         | 7.10%  |
| Baa           | 0.39%  | 0.59%  | 4.30%  | 85.81% | 1.33%  | 0.80%  | 0.48%         | 6.29%  |
| Ba            | 0.13%  | 0.13%  | 0.99%  | 5.17%  | 84.69% | 1.41%  | 1.64%         | 5.84%  |
| B             | 0.00%  | 0.03%  | 0.12%  | 0.49%  | 4.20%  | 85.09% | 3.18%         | 6.89%  |
| Caa and below | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.19%  | 0.00%  | 88.90%        | 10.91% |
| 2-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR     |
| Aaa           | 71.26% | 0.16%  | 0.04%  | 0.00%  | 0.00%  | 0.00%  | 0.00%         | 28.54% |
| Aa            | 14.25% | 64.46% | 1.60%  | 0.41%  | 0.05%  | 0.01%  | 0.01%         | 19.21% |
| A             | 4.34%  | 9.30%  | 65.70% | 1.76%  | 0.64%  | 0.18%  | 0.23%         | 17.85% |
| Baa           | 1.02%  | 1.88%  | 8.20%  | 69.48% | 1.17%  | 0.92%  | 0.95%         | 16.39% |
| Ba            | 0.37%  | 0.29%  | 3.09%  | 9.07%  | 68.72% | 1.61%  | 2.72%         | 14.14% |
| B             | 0.06%  | 0.09%  | 0.28%  | 1.02%  | 7.67%  | 69.66% | 4.81%         | 16.40% |
| Caa and below | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.42%  | 0.00%  | 79.37%        | 20.21% |
| 3-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR     |
| Aaa           | 57.11% | 0.18%  | 0.05%  | 0.01%  | 0.00%  | 0.00%  | 0.00%         | 42.65% |
| Aa            | 18.63% | 47.65% | 1.99%  | 0.61%  | 0.17%  | 0.06%  | 0.02%         | 30.87% |
| A             | 7.30%  | 11.17% | 47.72% | 1.86%  | 0.67%  | 0.41%  | 0.66%         | 30.21% |
| Baa           | 1.80%  | 2.88%  | 9.88%  | 53.16% | 1.19%  | 1.14%  | 1.75%         | 28.21% |
| Ba            | 0.62%  | 0.39%  | 5.11%  | 10.27% | 54.21% | 1.78%  | 3.74%         | 23.89% |
| B             | 0.16%  | 0.11%  | 0.20%  | 1.59%  | 8.01%  | 56.21% | 5.90%         | 27.82% |
| Caa and below | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.71%  | 0.00%  | 71.01%        | 28.28% |
| 4-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR     |
| Aaa           | 45.38% | 0.15%  | 0.06%  | 0.01%  | 0.00%  | 0.00%  | 0.00%         | 54.38% |
| Aa            | 20.13% | 35.30% | 2.06%  | 0.69%  | 0.20%  | 0.13%  | 0.09%         | 41.41% |
| A             | 8.77%  | 10.71% | 35.66% | 1.69%  | 0.57%  | 0.46%  | 1.07%         | 41.08% |
| Baa           | 2.58%  | 3.10%  | 9.11%  | 42.63% | 1.12%  | 1.23%  | 2.27%         | 37.97% |
| Ba            | 0.76%  | 0.48%  | 5.73%  | 9.83%  | 43.50% | 1.67%  | 4.50%         | 33.54% |
| B             | 0.27%  | 0.06%  | 0.06%  | 2.20%  | 5.85%  | 45.69% | 6.88%         | 38.98% |
| Caa and below | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.89%  | 0.00%  | 63.74%        | 35.37% |
| 5-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR     |
| Aaa           | 37.02% | 0.13%  | 0.06%  | 0.02%  | 0.00%  | 0.00%  | 0.00%         | 62.76% |
| Aa            | 19.98% | 26.17% | 1.83%  | 0.65%  | 0.17%  | 0.17%  | 0.19%         | 50.85% |
| A             | 8.87%  | 9.26%  | 28.00% | 1.50%  | 0.51%  | 0.43%  | 1.34%         | 50.09% |
| Baa           | 2.97%  | 2.69%  | 8.43%  | 35.53% | 0.94%  | 1.39%  | 2.52%         | 45.52% |
| Ba            | 0.88%  | 0.64%  | 5.28%  | 9.25%  | 35.52% | 1.46%  | 5.31%         | 41.67% |
| B             | 0.45%  | 0.00%  | 0.00%  | 2.70%  | 2.92%  | 38.49% | 7.64%         | 47.81% |
| Caa and below | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 1.02%  | 0.00%  | 57.61%        | 41.37% |

| 1-year        | Aaa           | Aa            | A             | Baa           | Ba            | B             | Caa and below | WR     |
|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|--------|
| Aaa           | <b>89.98%</b> | 0.45%         | 0.02%         | 0.00%         | 0.00%         | 0.01%         | 0.00%         | 9.54%  |
| Aa            | 15.85%        | <b>75.26%</b> | 0.71%         | 0.15%         | 0.05%         | 0.07%         | 0.02%         | 7.90%  |
| A             | 4.16%         | 10.11%        | <b>78.43%</b> | 1.22%         | 0.24%         | 0.02%         | 0.00%         | 5.82%  |
| Baa           | 0.89%         | 1.40%         | 6.53%         | <b>81.16%</b> | 1.78%         | 0.31%         | 0.20%         | 7.73%  |
| Ba            | 0.21%         | 0.03%         | 0.54%         | 3.38%         | <b>89.59%</b> | 2.17%         | 0.25%         | 3.83%  |
| B             | 0.11%         | 0.02%         | 0.02%         | 0.19%         | 1.18%         | <b>90.90%</b> | 5.12%         | 2.46%  |
| Caa and below | 0.10%         | 0.00%         | 0.00%         | 0.00%         | 0.07%         | 0.75%         | <b>91.29%</b> | 7.79%  |
| 2-year        | Aaa           | Aa            | A             | Baa           | Ba            | B             | Caa and below | WR     |
| Aaa           | <b>80.03%</b> | 0.69%         | 0.07%         | 0.00%         | 0.00%         | 0.01%         | 0.00%         | 19.20% |
| Aa            | 24.13%        | <b>55.85%</b> | 1.26%         | 0.26%         | 0.24%         | 0.05%         | 0.10%         | 18.12% |
| A             | 8.97%         | 14.61%        | <b>60.56%</b> | 1.77%         | 0.56%         | 0.05%         | 0.05%         | 13.43% |
| Baa           | 2.49%         | 3.19%         | 10.61%        | <b>62.93%</b> | 2.45%         | 0.61%         | 0.42%         | 17.31% |
| Ba            | 0.32%         | 0.22%         | 1.16%         | 6.11%         | <b>78.95%</b> | 4.16%         | 0.85%         | 8.23%  |
| B             | 0.08%         | 0.03%         | 0.08%         | 0.41%         | 2.01%         | <b>80.45%</b> | 11.27%        | 5.68%  |
| Caa and below | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.15%         | 1.46%         | <b>82.71%</b> | 15.67% |
| 3-year        | Aaa           | Aa            | A             | Baa           | Ba            | B             | Caa and below | WR     |
| Aaa           | <b>71.68%</b> | 0.74%         | 0.15%         | 0.00%         | 0.00%         | 0.02%         | 0.00%         | 27.42% |
| Aa            | 28.70%        | <b>41.82%</b> | 1.46%         | 0.43%         | 0.51%         | 0.05%         | 0.27%         | 26.75% |
| A             | 12.80%        | 16.77%        | <b>47.07%</b> | 2.02%         | 0.90%         | 0.08%         | 0.02%         | 20.33% |
| Baa           | 4.22%         | 4.43%         | 12.74%        | <b>49.14%</b> | 2.50%         | 0.63%         | 0.53%         | 25.81% |
| Ba            | 0.41%         | 0.72%         | 1.58%         | 7.98%         | <b>67.82%</b> | 6.14%         | 2.09%         | 13.26% |
| B             | 0.04%         | 0.02%         | 0.14%         | 0.59%         | 2.35%         | <b>68.26%</b> | 18.69%        | 9.90%  |
| Caa and below | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.14%         | 2.07%         | <b>75.45%</b> | 22.35% |
| 4-year        | Aaa           | Aa            | A             | Baa           | Ba            | B             | Caa and below | WR     |
| Aaa           | <b>64.16%</b> | 0.81%         | 0.22%         | 0.01%         | 0.00%         | 0.02%         | 0.00%         | 34.78% |
| Aa            | 30.72%        | <b>31.30%</b> | 1.62%         | 0.31%         | 0.79%         | 0.01%         | 0.40%         | 34.85% |
| A             | 16.64%        | 17.92%        | <b>35.78%</b> | 2.24%         | 0.84%         | 0.13%         | 0.00%         | 26.45% |
| Baa           | 5.90%         | 5.29%         | 14.30%        | <b>38.40%</b> | 2.69%         | 0.56%         | 0.70%         | 32.16% |
| Ba            | 0.53%         | 1.15%         | 1.95%         | 9.66%         | <b>56.89%</b> | 7.48%         | 3.93%         | 18.42% |
| B             | 0.00%         | 0.00%         | 0.15%         | 0.97%         | 2.54%         | <b>56.57%</b> | 25.42%        | 14.34% |
| Caa and below | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 3.07%         | <b>70.47%</b> | 26.46% |
| 5-year        | Aaa           | Aa            | A             | Baa           | Ba            | B             | Caa and below | WR     |
| Aaa           | <b>56.94%</b> | 0.90%         | 0.31%         | 0.04%         | 0.00%         | 0.00%         | 0.00%         | 41.81% |
| Aa            | 30.49%        | <b>22.84%</b> | 1.72%         | 0.30%         | 0.98%         | 0.00%         | 0.44%         | 43.23% |
| A             | 20.64%        | 17.91%        | <b>25.92%</b> | 2.15%         | 0.79%         | 0.13%         | 0.03%         | 32.43% |
| Baa           | 7.85%         | 6.40%         | 15.63%        | <b>30.56%</b> | 2.26%         | 0.67%         | 0.98%         | 35.66% |
| Ba            | 0.52%         | 1.79%         | 2.24%         | 10.56%        | <b>46.23%</b> | 8.39%         | 6.28%         | 23.98% |
| B             | 0.00%         | 0.00%         | 0.22%         | 1.35%         | 2.85%         | <b>45.55%</b> | 30.12%        | 19.91% |
| Caa and below | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 4.29%         | <b>66.79%</b> | 28.91% |

| 1-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR     |
|---------------|--------|--------|--------|--------|--------|--------|---------------|--------|
| Aaa           | 91.29% | 1.09%  | 0.32%  | 0.14%  | 0.04%  | 0.01%  | 0.01%         | 7.10%  |
| Aa            | 1.59%  | 86.53% | 3.15%  | 1.34%  | 0.42%  | 0.17%  | 0.09%         | 6.70%  |
| A             | 0.74%  | 1.35%  | 87.14% | 2.27%  | 1.03%  | 0.46%  | 0.40%         | 6.60%  |
| Baa           | 0.23%  | 0.45%  | 0.69%  | 84.83% | 3.51%  | 2.23%  | 1.89%         | 6.18%  |
| Ba            | 0.04%  | 0.13%  | 0.28%  | 1.13%  | 81.20% | 3.72%  | 5.63%         | 7.87%  |
| B             | 0.00%  | 0.13%  | 0.16%  | 0.72%  | 2.10%  | 66.93% | 22.32%        | 7.64%  |
| Caa and below | 0.00%  | 0.00%  | 0.00%  | 0.18%  | 0.19%  | 0.87%  | 92.91%        | 5.85%  |
| 2-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR     |
| Aaa           | 80.02% | 2.32%  | 0.85%  | 0.45%  | 0.13%  | 0.05%  | 0.01%         | 16.17% |
| Aa            | 2.84%  | 70.46% | 5.72%  | 3.32%  | 1.36%  | 0.63%  | 0.33%         | 15.37% |
| A             | 1.50%  | 2.42%  | 72.85% | 3.33%  | 1.77%  | 1.15%  | 1.26%         | 15.72% |
| Baa           | 0.45%  | 0.82%  | 1.17%  | 67.84% | 5.75%  | 4.16%  | 6.22%         | 13.60% |
| Ba            | 0.02%  | 0.26%  | 0.45%  | 1.92%  | 63.47% | 5.37%  | 12.53%        | 15.98% |
| B             | 0.14%  | 0.15%  | 0.26%  | 1.31%  | 3.34%  | 46.54% | 32.75%        | 15.50% |
| Caa and below | 0.00%  | 0.00%  | 0.02%  | 0.28%  | 0.40%  | 1.33%  | 86.81%        | 11.16% |
| 3-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR     |
| Aaa           | 66.86% | 3.61%  | 1.66%  | 1.02%  | 0.36%  | 0.16%  | 0.05%         | 26.27% |
| Aa            | 3.28%  | 54.08% | 7.57%  | 5.49%  | 2.83%  | 1.31%  | 1.19%         | 24.25% |
| A             | 1.93%  | 3.03%  | 56.98% | 3.77%  | 2.69%  | 1.85%  | 3.04%         | 26.70% |
| Baa           | 0.65%  | 0.94%  | 1.40%  | 49.40% | 7.05%  | 5.87%  | 12.88%        | 21.82% |
| Ba            | 0.00%  | 0.33%  | 0.41%  | 2.29%  | 47.14% | 5.98%  | 20.05%        | 23.79% |
| B             | 0.23%  | 0.18%  | 0.32%  | 1.69%  | 3.59%  | 33.07% | 39.84%        | 21.07% |
| Caa and below | 0.00%  | 0.00%  | 0.02%  | 0.31%  | 0.49%  | 1.42%  | 81.06%        | 16.70% |
| 4-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR     |
| Aaa           | 54.17% | 4.27%  | 2.25%  | 1.56%  | 0.68%  | 0.33%  | 0.14%         | 36.62% |
| Aa            | 3.87%  | 39.82% | 7.80%  | 7.05%  | 4.06%  | 1.91%  | 2.41%         | 33.09% |
| A             | 2.06%  | 3.37%  | 41.12% | 3.75%  | 3.20%  | 2.14%  | 5.23%         | 39.13% |
| Baa           | 0.57%  | 1.01%  | 1.41%  | 33.31% | 7.44%  | 6.63%  | 19.06%        | 30.58% |
| Ba            | 0.07%  | 0.26%  | 0.28%  | 2.11%  | 33.83% | 5.82%  | 25.08%        | 32.55% |
| B             | 0.06%  | 0.00%  | 0.32%  | 1.38%  | 2.74%  | 24.07% | 45.10%        | 26.32% |
| Caa and below | 0.00%  | 0.00%  | 0.00%  | 0.10%  | 0.25%  | 0.57%  | 78.03%        | 21.05% |
| 5-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR     |
| Aaa           | 43.02% | 4.08%  | 1.90%  | 1.80%  | 0.90%  | 0.44%  | 0.23%         | 47.64% |
| Aa            | 4.27%  | 27.62% | 7.50%  | 7.43%  | 4.47%  | 1.95%  | 3.92%         | 42.84% |
| A             | 1.86%  | 3.33%  | 27.50% | 3.68%  | 3.06%  | 2.37%  | 6.51%         | 51.67% |
| Baa           | 0.30%  | 0.94%  | 1.14%  | 21.32% | 7.33%  | 6.73%  | 23.31%        | 38.92% |
| Ba            | 0.02%  | 0.00%  | 0.34%  | 1.45%  | 22.02% | 5.36%  | 29.67%        | 41.14% |
| B             | 0.00%  | 0.00%  | 0.06%  | 0.11%  | 1.28%  | 15.06% | 52.64%        | 30.86% |
| Caa and below | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 78.13%        | 21.88% |

| Global SF     | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR     |
|---------------|--------|--------|--------|--------|--------|--------|---------------|--------|
| Aaa           | 84.11% | 0.21%  | 0.07%  | 0.03%  | 0.02%  | 0.01%  | 0.01%         | 15.54% |
| Aa            | 5.39%  | 83.96% | 1.36%  | 0.49%  | 0.14%  | 0.11%  | 0.17%         | 8.38%  |
| A             | 1.16%  | 3.62%  | 83.96% | 2.32%  | 0.67%  | 0.27%  | 0.25%         | 7.74%  |
| Baa           | 0.35%  | 0.52%  | 2.71%  | 84.38% | 2.50%  | 1.47%  | 1.31%         | 6.76%  |
| Ba            | 0.12%  | 0.09%  | 0.47%  | 2.69%  | 82.43% | 3.27%  | 4.54%         | 6.40%  |
| B             | 0.05%  | 0.04%  | 0.09%  | 0.35%  | 2.08%  | 81.72% | 9.81%         | 5.87%  |
| Caa and below | 0.03%  | 0.00%  | 0.00%  | 0.06%  | 0.09%  | 0.61%  | 90.36%        | 8.85%  |
| US ABS        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR     |
| Aaa           | 81.31% | 0.28%  | 0.14%  | 0.05%  | 0.04%  | 0.02%  | 0.03%         | 18.12% |
| Aa            | 2.22%  | 87.20% | 2.03%  | 0.80%  | 0.26%  | 0.25%  | 0.42%         | 6.82%  |
| A             | 0.44%  | 2.20%  | 84.48% | 3.25%  | 0.91%  | 0.43%  | 0.38%         | 7.90%  |
| Baa           | 0.15%  | 0.19%  | 1.11%  | 85.36% | 3.45%  | 2.28%  | 2.12%         | 5.34%  |
| Ba            | 0.04%  | 0.06%  | 0.08%  | 1.34%  | 76.11% | 6.23%  | 11.59%        | 4.55%  |
| B             | 0.00%  | 0.00%  | 0.11%  | 0.11%  | 0.23%  | 70.95% | 25.01%        | 3.59%  |
| Caa and below | 0.00%  | 0.00%  | 0.00%  | 0.01%  | 0.04%  | 0.06%  | 90.52%        | 9.36%  |
| US ABS ex HEL | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR     |
| Aaa           | 82.21% | 0.46%  | 0.27%  | 0.10%  | 0.09%  | 0.04%  | 0.06%         | 16.76% |
| Aa            | 2.47%  | 78.08% | 4.59%  | 1.93%  | 0.62%  | 0.66%  | 1.20%         | 10.45% |
| A             | 0.69%  | 2.65%  | 78.30% | 4.37%  | 0.89%  | 0.43%  | 0.49%         | 12.18% |
| Baa           | 0.44%  | 0.39%  | 1.63%  | 79.98% | 4.73%  | 1.69%  | 2.23%         | 8.90%  |
| Ba            | 0.10%  | 0.03%  | 0.14%  | 2.26%  | 69.54% | 7.76%  | 13.29%        | 6.87%  |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 70.10% | 27.21%        | 2.69%  |
| Caa and below | 0.00%  | 0.00%  | 0.00%  | 0.02%  | 0.06%  | 0.09%  | 92.96%        | 6.87%  |
| US HEL        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR     |
| Aaa           | 80.48% | 0.11%  | 0.02%  | 0.01%  | 0.00%  | 0.00%  | 0.01%         | 19.38% |
| Aa            | 2.09%  | 91.66% | 0.78%  | 0.25%  | 0.09%  | 0.04%  | 0.04%         | 5.05%  |
| A             | 0.20%  | 1.76%  | 90.58% | 2.16%  | 0.93%  | 0.43%  | 0.27%         | 3.68%  |
| Baa           | 0.03%  | 0.11%  | 0.90%  | 87.59% | 2.93%  | 2.53%  | 2.07%         | 3.86%  |
| Ba            | 0.00%  | 0.07%  | 0.05%  | 0.80%  | 80.03% | 5.31%  | 10.58%        | 3.17%  |
| B             | 0.00%  | 0.00%  | 0.30%  | 0.30%  | 0.65%  | 72.47% | 21.09%        | 5.19%  |
| Caa and below | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 83.91%        | 16.09% |
| US RMBS       | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR     |
| Aaa           | 85.09% | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%         | 14.90% |
| Aa            | 7.18%  | 82.44% | 0.06%  | 0.04%  | 0.00%  | 0.00%  | 0.02%         | 10.26% |
| A             | 1.46%  | 4.93%  | 83.78% | 1.07%  | 0.34%  | 0.08%  | 0.10%         | 8.24%  |
| Baa           | 0.46%  | 0.67%  | 4.47%  | 84.32% | 0.98%  | 0.82%  | 0.44%         | 7.83%  |
| Ba            | 0.13%  | 0.18%  | 1.13%  | 5.37%  | 83.58% | 0.79%  | 1.27%         | 7.56%  |
| B             | 0.00%  | 0.04%  | 0.16%  | 0.54%  | 5.08%  | 83.38% | 2.58%         | 8.22%  |
| Caa and below | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 87.85%        | 12.15% |
| US CMBS       | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR     |
| Aaa           | 89.90% | 0.40%  | 0.00%  | 0.00%  | 0.00%  | 0.01%  | 0.00%         | 9.69%  |
| Aa            | 18.36% | 73.47% | 0.64%  | 0.01%  | 0.00%  | 0.00%  | 0.00%         | 7.50%  |
| A             | 4.38%  | 10.65% | 77.64% | 1.14%  | 0.22%  | 0.02%  | 0.00%         | 5.95%  |
| Baa           | 0.92%  | 1.37%  | 6.77%  | 80.95% | 1.62%  | 0.29%  | 0.16%         | 7.91%  |
| Ba            | 0.22%  | 0.03%  | 0.57%  | 3.33%  | 89.64% | 2.21%  | 0.25%         | 3.74%  |
| B             | 0.11%  | 0.02%  | 0.02%  | 0.18%  | 1.00%  | 91.14% | 5.22%         | 2.31%  |
| Caa and below | 0.11%  | 0.00%  | 0.00%  | 0.00%  | 0.08%  | 0.60%  | 91.77%        | 7.44%  |
| US CDO        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR     |
| Aaa           | 91.36% | 1.11%  | 0.33%  | 0.14%  | 0.04%  | 0.01%  | 0.01%         | 7.00%  |
| Aa            | 1.65%  | 86.37% | 3.08%  | 1.42%  | 0.44%  | 0.18%  | 0.09%         | 6.75%  |
| A             | 0.76%  | 1.36%  | 87.31% | 2.27%  | 1.05%  | 0.48%  | 0.41%         | 6.36%  |
| Baa           | 0.23%  | 0.46%  | 0.71%  | 84.70% | 3.45%  | 2.30%  | 1.96%         | 6.19%  |
| Ba            | 0.04%  | 0.13%  | 0.29%  | 1.14%  | 81.03% | 3.75%  | 5.69%         | 7.94%  |
| B             | 0.00%  | 0.14%  | 0.17%  | 0.75%  | 2.18%  | 65.92% | 23.00%        | 7.84%  |
| Caa and below | 0.00%  | 0.00%  | 0.00%  | 0.18%  | 0.19%  | 0.87%  | 92.92%        | 5.85%  |

|      | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1  | Caa2  | Caa3  | Ca    | C     | WR   |      |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|
| Aaa  | 44305 | 92.9% | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 6.7% |      |
| Aa1  | 3330  | 4.9%  | 90.2% | 0.4%  | 0.1%  | 0.0%  | 0.1%  | 0.2%  |       | 0.2%  | 0.1%  | 0.2%  |       | 0.1%  | 0.0%  |       |       |       |       |       |       | 0.1%  |      | 3.5% |
| Aa2  | 6092  | 3.3%  | 2.1%  | 87.2% | 0.2%  | 0.5%  | 0.5%  | 0.4%  | 0.2%  | 0.3%  | 0.3%  | 0.2%  | 0.1%  | 0.0%  | 0.0%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.0% | 4.1% |
| Aa3  | 2730  | 2.0%  | 1.4%  | 2.2%  | 86.2% | 0.4%  | 0.3%  | 0.2%  | 0.2%  | 0.2%  | 0.3%  | 0.3%  | 0.3%  | 0.4%  | 0.1%  | 0.2%  | 0.0%  | 0.1%  | 0.2%  | 0.1%  | 0.3%  | 0.3%  | 4.3% |      |
| A1   | 2245  | 1.4%  | 1.4%  | 1.5%  | 2.8%  | 68.8% | 5.2%  | 4.6%  | 2.1%  | 2.8%  | 1.2%  | 0.9%  | 0.4%  | 0.0%  | 0.3%  | 0.4%  | 0.0%  | 0.1%  | 0.3%  | 0.0%  | 0.2%  | 0.4%  | 5.1% |      |
| A2   | 6293  | 0.5%  | 0.3%  | 1.3%  | 1.2%  | 1.2%  | 77.4% | 1.9%  | 2.1%  | 2.2%  | 2.0%  | 1.5%  | 1.2%  | 0.6%  | 0.2%  | 0.2%  | 0.4%  | 0.2%  | 0.3%  | 0.1%  | 0.4%  | 0.3%  | 4.7% |      |
| A3   | 3100  | 0.4%  | 0.2%  | 0.5%  | 1.3%  | 1.3%  | 1.5%  | 70.5% | 2.6%  | 3.3%  | 3.0%  | 2.3%  | 2.3%  | 1.6%  | 0.7%  | 0.8%  | 1.9%  | 0.2%  | 0.3%  | 0.2%  | 0.5%  | 1.0%  | 3.6% |      |
| Baa1 | 2823  | 0.5%  | 0.2%  | 0.0%  | 0.1%  | 1.0%  | 1.1%  | 1.4%  | 66.8% | 1.8%  | 3.5%  | 2.9%  | 2.7%  | 2.9%  | 1.5%  | 1.3%  | 3.9%  | 0.9%  | 0.8%  | 0.5%  | 1.1%  | 1.7%  | 3.3% |      |
| Baa2 | 5875  | 0.2%  | 0.0%  | 0.1%  | 0.1%  | 0.2%  | 1.0%  | 0.8%  | 1.4%  | 72.2% | 1.3%  | 2.1%  | 2.3%  | 1.7%  | 1.7%  | 1.4%  | 3.1%  | 0.7%  | 0.8%  | 0.9%  | 1.7%  | 1.5%  | 5.0% |      |
| Baa3 | 3422  | 0.3%  |       | 0.0%  | 0.1%  | 0.2%  | 0.1%  | 0.3%  | 0.8%  | 0.8%  | 65.9% | 1.8%  | 2.6%  | 2.5%  | 2.2%  | 1.8%  | 5.5%  | 1.0%  | 1.3%  | 1.2%  | 3.5%  | 4.9%  | 3.3% |      |
| Ba1  | 1558  | 0.1%  | 0.1%  |       | 0.1%  |       | 0.1%  |       | 0.3%  | 0.3%  | 0.9%  | 59.9% | 0.8%  | 1.8%  | 2.4%  | 1.7%  | 4.1%  | 1.7%  | 1.5%  | 2.2%  | 5.3%  | 12.7% | 4.0% |      |
| Ba2  | 2155  | 0.2%  | 0.0%  |       | 0.0%  |       |       | 0.1%  | 0.2%  | 0.8%  | 0.9%  | 1.0%  | 71.9% | 0.5%  | 1.0%  | 1.5%  | 2.5%  | 1.4%  | 1.4%  | 1.3%  | 2.2%  | 8.3%  | 4.7% |      |
| Ba3  | 756   | 0.5%  |       |       |       |       | 0.3%  |       |       | 0.1%  | 0.7%  | 0.4%  | 1.5%  | 82.1% | 0.8%  | 0.8%  | 1.6%  | 0.5%  | 0.5%  | 0.9%  | 0.8%  | 1.2%  | 7.3% |      |
| B1   | 412   | 0.5%  |       |       |       |       |       | 0.2%  |       |       | 0.5%  | 1.0%  | 1.0%  | 0.2%  | 80.6% | 1.2%  | 0.5%  | 1.7%  | 0.7%  | 2.7%  | 1.0%  | 2.2%  | 6.1% |      |
| B2   | 667   |       |       |       |       |       |       |       |       |       |       | 0.1%  | 0.9%  | 0.1%  | 1.3%  | 87.7% | 0.7%  | 0.6%  | 0.6%  | 1.3%  | 1.2%  | 0.7%  | 4.5% |      |
| B3   | 384   |       |       |       |       |       |       |       |       |       | 0.3%  | 0.5%  |       | 0.5%  |       | 0.3%  | 87.5% | 2.1%  | 1.8%  | 0.8%  | 1.6%  | 1.3%  | 3.4% |      |
| Caa1 | 151   |       |       |       |       |       |       |       |       |       | 0.7%  |       |       |       |       |       | 0.7%  | 88.1% | 1.3%  | 0.7%  | 2.0%  |       | 6.6% |      |
| Caa2 | 151   | 1.3%  |       |       |       |       |       |       |       |       |       | 1.3%  |       |       |       | 0.7%  | 1.3%  |       | 83.4% | 1.3%  | 3.3%  | 2.6%  | 4.6% |      |
| Caa3 | 105   |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 1.9%  |       | 1.0%  |       | 79.0% | 3.8%  | 7.6%  | 6.7% |      |
| Ca   | 313   |       |       |       |       |       |       |       |       |       | 0.3%  |       |       |       |       |       |       |       |       |       | 90.7% | 3.8%  | 5.1% |      |
| C    | 466   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 0.4%  | 92.7% | 6.9% |      |



|      | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3   | Caa1  | Caa2  | Caa3  | Ca    | C     | WR    |      |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|------|
| Aaa  | 12239 | 87.3% | 0.2%  | 0.2%  | 0.1%  | 0.0%  |       | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.1%  |       |       |       |       | 0.0% |       |       |       |       |       | 12.2% |      |
| Aa1  | 1126  | 2.3%  | 92.1% | 0.4%  | 0.3%  | 0.1%  | 0.3%  | 0.4%  |       | 0.4%  | 0.3%  | 0.4%  |       | 0.2%  | 0.1%  |       |      |       |       |       |       | 0.1%  |       | 2.7% |
| Aa2  | 2104  | 3.2%  | 1.6%  | 88.4% | 0.2%  | 0.5%  | 0.2%  | 0.3%  | 0.1%  | 0.1%  | 0.6%  | 0.4%  | 0.1%  | 0.0%  | 0.1%  | 0.3%  | 0.0% | 0.1%  | 0.1%  |       | 0.2%  | 0.1%  | 3.3%  |      |
| Aa3  | 1166  | 0.8%  | 0.8%  | 0.7%  | 91.2% | 0.1%  | 0.1%  | 0.3%  | 0.3%  | 0.3%  | 0.3%  | 0.3%  | 0.4%  | 0.6%  | 0.2%  | 0.4%  |      | 0.1%  | 0.4%  | 0.1%  | 0.5%  | 0.4%  | 1.9%  |      |
| A1   | 1131  | 0.7%  | 0.3%  | 0.9%  | 3.3%  | 69.2% | 5.1%  | 5.1%  | 2.7%  | 3.4%  | 1.9%  | 1.2%  | 0.6%  | 0.1%  | 0.4%  | 0.6%  | 0.1% | 0.1%  | 0.4%  | 0.1%  | 0.4%  | 0.9%  | 2.3%  |      |
| A2   | 2560  | 0.1%  | 0.2%  | 1.1%  | 0.7%  | 1.0%  | 76.7% | 2.2%  | 2.6%  | 2.1%  | 2.4%  | 1.6%  | 1.8%  | 0.8%  | 0.3%  | 0.3%  | 0.7% | 0.2%  | 0.5%  | 0.1%  | 0.3%  | 0.7%  | 3.7%  |      |
| A3   | 1529  | 0.1%  | 0.2%  | 0.2%  | 0.6%  | 0.6%  | 0.2%  | 68.8% | 2.6%  | 4.1%  | 3.8%  | 2.7%  | 3.0%  | 1.9%  | 1.0%  | 1.4%  | 3.5% | 0.1%  | 0.5%  | 0.1%  | 0.9%  | 2.0%  | 1.7%  |      |
| Baa1 | 1628  | 0.1%  | 0.1%  |       |       | 0.2%  | 0.3%  | 0.5%  | 64.2% | 2.1%  | 4.1%  | 3.0%  | 3.3%  | 3.6%  | 1.8%  | 1.6%  | 6.1% | 1.6%  | 1.0%  | 0.4%  | 1.5%  | 2.8%  | 1.7%  |      |
| Baa2 | 2124  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.4%  | 0.3%  | 1.5%  | 64.4% | 1.5%  | 2.8%  | 3.3%  | 2.4%  | 2.2%  | 2.0%  | 6.0% | 1.1%  | 1.5%  | 1.0%  | 2.7%  | 3.5%  | 3.0%  |      |
| Baa3 | 1712  | 0.1%  |       |       | 0.1%  | 0.1%  |       |       | 0.1%  | 0.1%  | 58.6% | 2.3%  | 3.4%  | 2.9%  | 2.6%  | 2.0%  | 8.2% | 1.4%  | 1.7%  | 1.9%  | 5.1%  | 8.5%  | 0.9%  |      |
| Ba1  | 828   |       |       |       |       |       |       |       |       |       |       | 46.6% | 0.7%  | 2.5%  | 2.8%  | 2.2%  | 6.4% | 2.3%  | 1.7%  | 3.0%  | 6.9%  | 23.3% | 1.6%  |      |
| Ba2  | 593   |       | 0.2%  |       | 0.2%  |       |       |       |       |       |       |       | 47.7% | 0.3%  | 1.7%  | 2.9%  | 5.6% | 2.7%  | 2.2%  | 1.5%  | 5.6%  | 27.7% | 1.9%  |      |
| Ba3  | 112   |       |       |       |       |       | 1.8%  |       |       |       |       |       |       | 75.9% | 0.9%  | 1.8%  | 4.5% | 0.9%  | 2.7%  | 0.9%  | 0.9%  | 7.1%  | 2.7%  |      |
| B1   | 88    |       |       |       |       |       |       |       |       |       |       |       |       | 68.2% |       |       | 2.3% | 3.4%  | 1.1%  | 11.4% | 2.3%  | 10.2% | 1.1%  |      |
| B2   | 91    |       |       |       |       |       |       |       |       |       |       |       |       |       | 86.8% |       |      | 2.2%  | 3.3%  | 1.1%  | 1.1%  | 2.2%  | 3.3%  |      |
| B3   | 68    |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 76.5% |      |       | 5.9%  | 4.4%  | 4.4%  | 7.4%  | 1.5%  |      |
| Caa1 | 61    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      | 93.4% |       |       | 3.3%  |       | 3.3%  |      |
| Caa2 | 59    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       | 93.2% |       | 3.4%  | 3.4%  |       |      |
| Caa3 | 44    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       | 84.1% |       | 11.4% | 4.5%  |      |
| Ca   | 135   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       | 89.6% | 4.4%  | 5.9%  |      |
| C    | 272   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |       | 96.0% | 4.0%  |      |

|      | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1  | Caa2   | Caa3  | Ca    | C     | WR    |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|-------|-------|-------|-------|
| Aaa  | 4424  | 88.3% |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |        |       |       |       | 11.7% |
| Aa1  | 147   | 4.8%  | 87.8% |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |        |       |       |       | 7.5%  |
| Aa2  | 245   | 6.9%  | 2.9%  | 83.3% |       |       | 0.4%  |       |       |       |       |       |       |       |       |       |       |       |        |       |       |       | 6.5%  |
| Aa3  | 152   | 3.3%  | 2.0%  | 1.3%  | 84.2% |       |       |       |       |       |       |       |       |       |       |       |       |       |        |       |       |       | 9.2%  |
| A1   | 189   | 4.2%  | 1.1%  | 1.1%  | 18.5% | 64.0% |       | 1.1%  |       |       | 0.5%  |       |       |       |       |       |       |       |        |       |       |       | 9.5%  |
| A2   | 715   | 0.3%  | 0.4%  | 0.1%  | 0.1%  | 2.1%  | 89.2% |       |       |       |       |       |       |       |       |       |       |       |        |       |       |       | 7.7%  |
| A3   | 119   | 1.7%  | 2.5%  | 1.7%  | 2.5%  |       | 0.8%  | 86.6% |       |       |       |       |       |       |       |       |       |       |        |       |       |       | 4.2%  |
| Baa1 | 168   |       | 0.6%  |       |       | 0.6%  | 0.6%  | 3.6%  | 84.5% |       | 1.2%  |       |       |       |       |       | 0.6%  |       |        |       |       |       | 8.3%  |
| Baa2 | 358   | 0.6%  | 0.3%  |       | 0.3%  | 0.3%  |       | 0.6%  | 8.7%  | 79.6% | 0.3%  |       |       | 0.3%  |       | 0.6%  |       |       |        |       |       |       | 8.7%  |
| Baa3 | 234   | 0.4%  |       |       | 0.9%  | 0.4%  |       |       |       |       | 94.9% |       |       | 0.4%  |       |       | 0.4%  |       |        |       |       |       | 2.6%  |
| Ba1  | 112   |       |       |       |       |       |       |       |       |       |       | 95.5% |       |       |       |       |       |       |        |       |       |       | 4.5%  |
| Ba2  | 69    |       | 1.4%  |       | 1.4%  |       |       |       |       |       |       |       | 89.9% | 1.4%  |       | 1.4%  |       |       | 1.4%   |       |       |       | 2.9%  |
| Ba3  | 42    |       |       |       |       |       | 4.8%  |       |       |       |       |       |       | 90.5% |       |       |       |       |        |       |       |       | 4.8%  |
| B1   | 40    |       |       |       |       |       |       |       |       |       |       |       |       |       | 90.0% |       | 2.5%  |       |        |       | 7.5%  |       |       |
| B2   | 43    |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 93.0% |       |       |        |       | 2.3%  |       | 4.7%  |
| B3   | 50    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 92.0% |       |        |       | 6.0%  |       | 2.0%  |
| Caa1 | 44    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 90.9% |        |       |       | 4.5%  | 4.5%  |
| Caa2 | 28    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 100.0% |       |       |       |       |
| Caa3 | 27    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |        | 85.2% |       | 7.4%  | 7.4%  |
| Ca   | 104   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |        |       | 89.4% | 2.9%  | 7.7%  |
| C    | 253   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |        |       |       | 95.7% | 4.3%  |

|      | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1   | Caa2  | Caa3  | Ca    | C      | WR    |      |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|-------|-------|-------|--------|-------|------|
| Aaa  | 7815  | 86.7% | 0.2%  | 0.3%  | 0.1%  | 0.1%  |       | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.1%  |       |       |       |       | 0.0%  |        |       |       |       |        | 12.4% |      |
| Aa1  | 979   | 1.9%  | 92.7% | 0.5%  | 0.3%  | 0.1%  | 0.3%  | 0.5%  |       | 0.5%  | 0.3%  | 0.4%  |       | 0.2%  | 0.1%  |       |       |        |       |       |       | 0.1%   |       | 1.9% |
| Aa2  | 1859  | 2.7%  | 1.4%  | 89.1% | 0.2%  | 0.5%  | 0.2%  | 0.4%  | 0.1%  | 0.2%  | 0.6%  | 0.5%  | 0.1%  | 0.1%  | 0.1%  | 0.3%  | 0.1%  | 0.2%   | 0.1%  |       | 0.2%  | 0.1%   | 2.9%  |      |
| Aa3  | 1014  | 0.4%  | 0.6%  | 0.6%  | 92.2% | 0.1%  | 0.1%  | 0.3%  | 0.3%  | 0.3%  | 0.3%  | 0.4%  | 0.5%  | 0.7%  | 0.2%  | 0.5%  |       | 0.1%   | 0.5%  | 0.1%  | 0.6%  | 0.5%   | 0.8%  |      |
| A1   | 942   |       | 0.1%  | 0.8%  | 0.2%  | 70.3% | 6.2%  | 5.9%  | 3.3%  | 4.1%  | 2.1%  | 1.5%  | 0.7%  | 0.1%  | 0.5%  | 0.7%  | 0.1%  | 0.1%   | 0.5%  | 0.1%  | 0.5%  | 1.1%   | 0.8%  |      |
| A2   | 1845  | 0.1%  | 0.1%  | 1.5%  | 0.9%  | 0.5%  | 71.9% | 3.0%  | 3.6%  | 2.9%  | 3.4%  | 2.3%  | 2.5%  | 1.1%  | 0.4%  | 0.4%  | 1.0%  | 0.2%   | 0.7%  | 0.1%  | 0.4%  | 1.0%   | 2.2%  |      |
| A3   | 1410  |       |       | 0.1%  | 0.4%  | 0.6%  | 0.1%  | 67.3% | 2.8%  | 4.4%  | 4.1%  | 3.0%  | 3.3%  | 2.1%  | 1.1%  | 1.5%  | 3.8%  | 0.1%   | 0.5%  | 0.1%  | 1.0%  | 2.2%   | 1.5%  |      |
| Baa1 | 1460  | 0.1%  |       |       |       | 0.2%  | 0.3%  | 0.1%  | 61.8% | 2.3%  | 4.4%  | 3.4%  | 3.7%  | 4.0%  | 2.1%  | 1.8%  | 6.7%  | 1.8%   | 1.2%  | 0.5%  | 1.6%  | 3.1%   | 1.0%  |      |
| Baa2 | 1766  | 0.1%  |       | 0.1%  |       |       | 0.5%  | 0.3%  |       | 61.3% | 1.8%  | 3.4%  | 4.0%  | 2.8%  | 2.6%  | 2.3%  | 7.2%  | 1.4%   | 1.8%  | 1.2%  | 3.3%  | 4.2%   | 1.9%  |      |
| Baa3 | 1478  | 0.1%  |       |       |       |       |       |       | 0.1%  | 0.1%  | 52.8% | 2.7%  | 3.9%  | 3.3%  | 3.0%  | 2.4%  | 9.4%  | 1.6%   | 2.0%  | 2.2%  | 5.9%  | 9.9%   | 0.6%  |      |
| Ba1  | 716   |       |       |       |       |       |       |       |       |       |       | 39.0% | 0.8%  | 2.9%  | 3.2%  | 2.5%  | 7.4%  | 2.7%   | 2.0%  | 3.5%  | 8.0%  | 27.0%  | 1.1%  |      |
| Ba2  | 524   |       |       |       |       |       |       |       |       |       |       |       | 42.2% | 0.2%  | 1.9%  | 3.1%  | 6.3%  | 3.1%   | 2.3%  | 1.7%  | 6.3%  | 31.3%  | 1.7%  |      |
| Ba3  | 70    |       |       |       |       |       |       |       |       |       |       |       |       | 67.1% | 1.4%  | 2.9%  | 7.1%  | 1.4%   | 4.3%  | 1.4%  | 1.4%  | 11.4%  | 1.4%  |      |
| B1   | 48    |       |       |       |       |       |       |       |       |       |       |       |       |       | 50.0% |       | 2.1%  | 6.3%   | 2.1%  | 14.6% | 4.2%  | 18.8%  | 2.1%  |      |
| B2   | 48    |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 81.3% |       | 4.2%   | 6.3%  |       | 2.1%  | 4.2%   | 2.1%  |      |
| B3   | 18    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 33.3% |        | 22.2% | 16.7% |       | 27.8%  |       |      |
| Caa1 | 17    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 100.0% |       |       |       |        |       |      |
| Caa2 | 31    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |        | 87.1% |       | 6.5%  | 6.5%   |       |      |
| Caa3 | 17    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |        |       | 82.4% |       | 17.6%  |       |      |
| Ca   | 31    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |        |       |       | 90.3% | 9.7%   |       |      |
| C    | 19    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |        |       |       |       | 100.0% |       |      |

|      | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1  | Caa2   | Caa3  | Ca    | C     | WR    |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|-------|-------|-------|-------|
| Aaa  | 21538 | 98.6% | 0.0%  | 0.0%  |       | 0.0%  |       |       |       |       |       |       |       |       |       |       |       |       |        |       |       |       | 1.4%  |
| Aa1  | 1493  | 1.1%  | 98.3% |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |        |       |       |       | 0.6%  |
| Aa2  | 1511  | 2.3%  | 0.9%  | 94.7% |       | 0.1%  | 0.3%  |       |       | 0.3%  |       |       |       |       |       |       |       |       |        | 0.1%  |       |       | 1.4%  |
| Aa3  | 518   | 0.6%  |       | 0.2%  | 98.1% |       |       |       |       |       |       |       | 0.2%  |       |       |       |       |       |        |       |       |       | 1.0%  |
| A1   | 386   |       |       |       | 0.5%  | 63.5% | 10.6% | 10.6% | 3.9%  | 5.7%  | 1.0%  | 1.3%  | 0.3%  |       | 0.3%  | 0.3%  |       | 0.3%  |        |       |       |       | 1.8%  |
| A2   | 1336  |       | 0.1%  | 1.7%  | 1.0%  | 0.4%  | 74.9% | 3.9%  | 4.2%  | 4.5%  | 2.8%  | 2.4%  | 1.2%  | 0.4%  | 0.2%  | 0.4%  | 0.1%  | 0.1%  |        |       |       | 0.1%  | 1.6%  |
| A3   | 532   |       |       |       | 0.8%  |       | 0.2%  | 65.6% | 7.0%  | 6.4%  | 4.9%  | 4.5%  | 2.8%  | 3.4%  | 0.9%  | 0.8%  | 0.8%  | 0.6%  |        | 0.4%  |       |       | 1.1%  |
| Baa1 | 387   |       |       |       |       |       | 0.3%  | 0.5%  | 56.8% | 3.6%  | 6.7%  | 7.8%  | 5.2%  | 5.9%  | 2.8%  | 2.8%  | 2.8%  |       | 1.6%   | 0.8%  | 1.0%  | 0.5%  | 0.8%  |
| Baa2 | 1247  |       |       |       |       | 0.1%  | 1.6%  | 0.7%  | 1.1%  | 71.8% | 2.3%  | 4.1%  | 3.1%  | 1.4%  | 3.1%  | 2.6%  | 3.7%  | 0.8%  | 0.6%   | 0.9%  | 0.3%  | 0.6%  | 1.0%  |
| Baa3 | 582   |       |       |       |       |       |       | 0.7%  |       |       | 60.8% | 2.6%  | 3.8%  | 5.0%  | 4.1%  | 4.0%  | 7.4%  | 1.5%  | 2.4%   | 0.7%  | 2.7%  | 3.4%  | 0.9%  |
| Ba1  | 117   |       |       |       |       |       |       |       |       |       |       | 65.8% | 1.7%  | 2.6%  | 3.4%  | 0.9%  | 6.8%  | 3.4%  | 3.4%   | 1.7%  | 6.0%  | 1.7%  | 2.6%  |
| Ba2  | 472   |       |       |       |       |       | 0.4%  |       |       | 3.2%  | 1.5%  | 0.6%  | 71.2% | 0.8%  | 1.3%  | 2.1%  | 3.8%  | 2.3%  | 3.0%   | 3.2%  | 1.7%  | 2.5%  | 2.3%  |
| Ba3  | 91    |       |       |       |       |       |       |       |       |       | 3.3%  | 2.2%  | 3.3%  | 76.9% |       |       | 2.2%  | 3.3%  |        | 2.2%  | 3.3%  | 1.1%  | 2.2%  |
| B1   | 10    |       |       |       |       |       |       |       |       |       |       |       |       |       | 80.0% |       |       | 20.0% |        |       |       |       |       |
| B2   | 242   |       |       |       |       |       |       |       |       |       |       | 0.4%  | 2.1%  | 0.4%  | 2.9%  | 84.7% | 0.8%  |       |        | 2.5%  | 2.1%  | 1.2%  | 2.9%  |
| B3   | 25    |       |       |       |       |       |       |       |       |       |       |       |       | 4.0%  |       |       | 92.0% |       |        |       |       |       | 4.0%  |
| Caa1 | 24    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 95.8% |        |       | 4.2%  |       |       |
| Caa2 | 11    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 100.0% |       |       |       |       |
| Caa3 | 4     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |        | 75.0% | 25.0% |       |       |
| Ca   | 13    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |        |       | 92.3% |       | 7.7%  |
| C    | 4     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |        |       |       | 75.0% | 25.0% |

|      | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1  | Caa2  | Caa3  | Ca    | C     | WR    |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Aaa  | 3106  | 91.1% |       |       | 0.0%  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 8.8%  |
| Aa1  | 181   | 44.8% | 46.4% |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 8.8%  |
| Aa2  | 407   | 16.2% | 10.8% | 68.3% |       |       | 0.2%  |       | 0.2%  |       |       |       |       |       |       |       |       |       |       |       |       |       | 4.2%  |
| Aa3  | 279   | 14.0% | 7.5%  | 13.3% | 62.7% |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 2.5%  |
| A1   | 197   | 9.6%  | 10.7% | 7.1%  | 8.1%  | 59.9% |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 4.6%  |
| A2   | 366   | 4.4%  | 2.7%  | 3.6%  | 6.8%  | 6.0%  | 71.9% |       |       |       | 0.3%  | 0.3%  | 0.3%  |       |       |       |       |       |       |       |       |       | 3.8%  |
| A3   | 350   | 1.7%  | 0.6%  | 2.3%  | 4.6%  | 6.0%  | 8.9%  | 74.6% |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 1.4%  |
| Baa1 | 368   | 3.0%  | 0.3%  | 0.3%  | 0.8%  | 3.0%  | 6.0%  | 5.2%  | 78.3% |       | 0.3%  |       |       |       |       |       |       |       |       |       |       |       | 3.0%  |
| Baa2 | 444   | 1.1%  |       |       | 0.2%  | 0.9%  | 4.3%  | 4.7%  | 5.6%  | 80.0% |       |       | 0.2%  |       |       |       |       |       |       |       |       |       | 2.9%  |
| Baa3 | 471   | 1.7%  |       |       |       | 1.1%  | 0.6%  | 1.1%  | 4.2%  | 4.2%  | 79.6% | 0.4%  | 0.4%  |       |       | 0.2%  |       |       |       |       |       |       | 6.4%  |
| Ba1  | 322   | 0.6%  |       |       | 0.3%  |       | 0.3%  |       | 0.9%  | 1.2%  | 4.0%  | 86.6% | 0.6%  | 0.6%  |       | 0.3%  |       |       |       |       |       |       | 4.3%  |
| Ba2  | 345   | 0.6%  |       |       |       |       |       |       | 0.3%  | 0.3%  | 0.9%  | 3.2%  | 91.0% | 0.9%  | 0.3%  |       |       |       |       |       |       |       | 2.6%  |
| Ba3  | 301   | 0.7%  |       |       |       |       |       |       |       | 0.3%  |       | 0.3%  | 2.0%  | 93.0% | 1.0%  | 0.3%  |       |       | 0.3%  |       |       |       | 2.0%  |
| B1   | 242   | 0.8%  |       |       |       |       |       |       |       |       | 0.8%  | 0.4%  | 0.4%  | 0.4%  | 93.0% | 1.7%  |       | 0.8%  |       |       |       |       | 1.7%  |
| B2   | 264   |       |       |       |       |       |       |       |       |       |       |       | 0.4%  |       |       | 95.8% | 1.1%  | 0.4%  |       | 0.4%  | 0.4%  |       | 1.5%  |
| B3   | 245   |       |       |       |       |       |       |       |       |       | 0.4%  |       |       |       |       | 0.4%  | 94.7% | 3.3%  | 0.4%  |       | 0.8%  |       |       |
| Caa1 | 30    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 3.3%  | 90.0% | 6.7%  |       |       |       |       |
| Caa2 | 41    |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 2.4%  |       |       | 87.8% | 2.4%  | 2.4%  | 4.9%  |       |
| Caa3 | 20    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 95.0% | 5.0%  |       |       |
| Ca   | 25    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 80.0% | 16.0% | 4.0%  |
| C    | 36    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 83.3% | 16.7% |

|      | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3  | B1   | B2   | B3   | Caa1 | Caa2  | Caa3 | Ca    | C     | WR    |       |       |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|------|------|------|-------|------|-------|-------|-------|-------|-------|
| Aaa  | 2844  | 90.6% | 0.2%  | 0.2%  | 0.2%  | 0.2%  | 0.4%  | 0.3%  | 0.2%  | 0.1%  | 0.3%  | 0.3%  | 0.1%  | 0.1% | 0.1% | 0.1% | 0.1% | 0.1% | 0.0%  | 0.0% | 0.0%  | 0.1%  | 6.3%  |       |       |
| Aa1  | 200   | 5.0%  | 86.0% |       |       |       |       | 1.0%  |       |       |       | 0.5%  |       | 0.5% |      |      |      |      |       |      |       |       | 7.0%  |       |       |
| Aa2  | 1009  | 0.5%  | 0.4%  | 86.5% |       | 0.2%  | 0.9%  | 1.3%  | 0.5%  | 0.6%  | 0.8%  | 0.4%  | 0.2%  | 0.2% | 0.1% |      | 0.4% | 0.2% | 0.5%  | 0.5% | 0.2%  | 0.1%  | 5.6%  |       |       |
| Aa3  | 207   | 0.5%  |       | 0.5%  | 72.0% |       | 1.4%  | 1.4%  | 1.4%  | 1.4%  | 1.9%  | 1.9%  | 0.5%  | 1.4% | 0.5% | 0.5% | 0.5% | 1.0% |       | 1.4% | 0.5%  | 0.5%  | 10.6% |       |       |
| A1   | 130   |       | 0.8%  | 2.3%  | 1.5%  | 72.3% |       |       | 1.5%  | 0.8%  | 0.8%  | 1.5%  | 0.8%  |      | 0.8% | 0.8% |      |      | 0.8%  |      |       |       | 15.4% |       |       |
| A2   | 982   |       |       | 0.4%  | 0.2%  | 0.1%  | 82.1% | 0.2%  | 0.2%  | 1.8%  | 2.0%  | 1.7%  | 0.9%  | 1.0% | 0.2% | 0.1% | 0.4% | 0.5% | 0.7%  | 0.5% | 1.6%  | 0.1%  | 5.1%  |       |       |
| A3   | 393   | 0.5%  |       | 0.5%  | 2.3%  | 1.0%  | 1.3%  | 76.3% | 1.0%  | 0.3%  | 1.3%  | 1.0%  | 2.5%  | 0.5% | 0.3% | 0.3% |      | 0.5% | 0.3%  | 1.0% | 0.5%  |       | 8.7%  |       |       |
| Baa1 | 117   | 0.9%  | 3.4%  |       |       |       |       |       | 74.4% |       | 1.7%  | 1.7%  | 2.6%  | 0.9% |      |      |      |      |       |      |       |       | 3.4%  | 11.1% |       |
| Baa2 | 1144  | 0.3%  |       | 0.3%  |       | 0.1%  | 0.4%  | 0.1%  | 0.3%  | 77.9% | 0.3%  | 0.5%  | 1.8%  | 2.4% | 1.5% | 0.8% | 0.3% | 0.5% | 0.6%  | 1.4% | 2.7%  | 0.2%  | 7.5%  |       |       |
| Baa3 | 272   |       |       | 0.4%  |       |       |       |       | 0.7%  |       | 73.9% |       | 0.7%  | 2.2% | 2.6% | 1.5% | 1.8% | 0.4% |       | 1.5% | 5.9%  | 0.7%  | 7.7%  |       |       |
| Ba1  | 146   |       |       |       |       |       |       |       | 0.7%  |       |       | 52.7% | 0.7%  | 0.7% | 7.5% | 4.1% | 2.1% | 2.7% | 3.4%  | 4.1% | 13.0% | 2.1%  | 6.2%  |       |       |
| Ba2  | 456   |       |       |       |       |       |       | 0.2%  | 0.4%  | 0.4%  | 0.9%  | 0.2%  | 83.3% |      | 0.9% | 0.9% | 0.7% | 0.7% | 0.7%  | 0.4% | 1.5%  | 0.4%  | 8.3%  |       |       |
| Ba3  | 119   |       |       |       |       |       |       |       |       |       | 1.7%  |       |       |      |      |      |      |      |       |      |       |       | 3.4%  | 1.7%  | 23.5% |
| B1   | 34    |       |       |       |       |       |       | 2.9%  |       |       |       |       | 2.9%  |      |      |      |      |      |       |      | 5.9%  | 2.9%  | 5.9%  | 14.7% |       |
| B2   | 35    |       |       |       |       |       |       |       |       |       |       |       |       |      | 2.9% |      |      |      |       |      | 2.9%  | 2.9%  |       | 20.0% |       |
| B3   | 22    |       |       |       |       |       |       |       |       |       |       | 9.1%  |       | 4.5% |      |      |      |      |       |      | 4.5%  |       |       | 4.5%  |       |
| Caa1 | 21    |       |       |       |       |       |       |       |       |       |       |       |       |      |      |      |      |      | 81.0% |      | 4.8%  |       |       | 14.3% |       |
| Caa2 | 30    |       |       |       |       |       |       |       |       |       |       | 6.7%  |       |      |      |      |      |      |       | 6.7% | 56.7% | 3.3%  | 6.7%  | 20.0% |       |
| Caa3 | 27    |       |       |       |       |       |       |       |       |       |       |       |       |      |      | 7.4% |      |      |       |      | 66.7% | 7.4%  | 11.1% | 7.4%  |       |
| Ca   | 118   |       |       |       |       |       |       |       |       |       | 0.8%  |       |       |      |      |      |      |      |       |      |       | 93.2% | 1.7%  | 4.2%  |       |
| C    | 141   |       |       |       |       |       |       |       |       |       |       |       |       |      |      |      |      |      |       |      |       |       | 1.4%  | 89.4% | 9.2%  |

|      | Total   | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1  | Caa2  | Caa3  | Ca    | C     | WR    |
|------|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Aaa  | 2945741 | 85.5% | 0.1%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 14.1% |
| Aa1  | 140389  | 9.2%  | 79.8% | 0.6%  | 0.3%  | 0.5%  | 0.2%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  |       | 0.0%  |       | 9.0%  |
| Aa2  | 339384  | 4.9%  | 1.5%  | 83.7% | 0.7%  | 0.5%  | 0.4%  | 0.3%  | 0.1%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 7.5%  |
| Aa3  | 113495  | 3.5%  | 1.9%  | 2.1%  | 79.5% | 1.2%  | 0.9%  | 0.9%  | 0.5%  | 0.4%  | 0.2%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.3%  | 0.0%  | 7.8%  |
| A1   | 97777   | 2.1%  | 1.0%  | 1.7%  | 2.8%  | 76.5% | 1.4%  | 1.3%  | 1.1%  | 1.8%  | 0.4%  | 0.2%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.1%  | 0.0%  | 9.3%  |
| A2   | 316093  | 0.9%  | 0.5%  | 1.6%  | 1.1%  | 1.4%  | 84.6% | 0.4%  | 0.5%  | 0.5%  | 0.4%  | 0.2%  | 0.2%  | 0.1%  | 0.1%  | 0.0%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.1%  | 7.3%  |
| A3   | 112435  | 1.0%  | 0.4%  | 0.7%  | 1.6%  | 1.4%  | 1.5%  | 81.1% | 0.9%  | 1.5%  | 1.2%  | 0.7%  | 0.4%  | 0.3%  | 0.2%  | 0.2%  | 0.2%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 6.1%  |
| Baa1 | 85819   | 0.6%  | 0.1%  | 0.3%  | 0.4%  | 1.1%  | 1.4%  | 1.5%  | 82.3% | 1.0%  | 1.6%  | 1.1%  | 0.5%  | 0.6%  | 0.5%  | 0.2%  | 0.5%  | 0.2%  | 0.1%  | 0.1%  | 0.2%  | 0.2%  | 5.5%  |
| Baa2 | 255151  | 0.3%  | 0.1%  | 0.2%  | 0.3%  | 0.4%  | 1.5%  | 1.1%  | 1.5%  | 82.7% | 1.3%  | 1.1%  | 0.7%  | 0.5%  | 0.4%  | 0.3%  | 0.4%  | 0.2%  | 0.2%  | 0.2%  | 0.3%  | 0.2%  | 6.2%  |
| Baa3 | 142859  | 0.3%  | 0.0%  | 0.1%  | 0.1%  | 0.3%  | 0.4%  | 0.8%  | 1.0%  | 1.4%  | 81.1% | 1.2%  | 1.0%  | 1.2%  | 0.7%  | 0.5%  | 0.7%  | 0.3%  | 0.3%  | 0.3%  | 0.6%  | 0.5%  | 7.1%  |
| Ba1  | 45701   | 0.2%  | 0.0%  | 0.0%  | 0.0%  | 0.1%  | 0.3%  | 0.4%  | 0.6%  | 0.9%  | 2.1%  | 78.8% | 1.1%  | 1.6%  | 1.2%  | 1.0%  | 1.5%  | 0.6%  | 0.8%  | 0.4%  | 1.0%  | 1.7%  | 5.7%  |
| Ba2  | 90149   | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.1%  | 0.1%  | 0.2%  | 0.4%  | 1.4%  | 1.1%  | 1.4%  | 81.9% | 0.7%  | 0.9%  | 0.9%  | 0.9%  | 0.7%  | 0.6%  | 0.4%  | 0.6%  | 1.5%  | 5.9%  |
| Ba3  | 44471   | 0.1%  |       |       | 0.0%  | 0.1%  | 0.2%  | 0.1%  | 0.1%  | 0.2%  | 1.2%  | 0.8%  | 1.1%  | 79.5% | 1.4%  | 1.1%  | 1.5%  | 1.0%  | 1.1%  | 0.9%  | 1.2%  | 1.4%  | 6.8%  |
| B1   | 19206   | 0.1%  |       |       | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.1%  | 0.3%  | 0.3%  | 0.9%  | 0.7%  | 76.3% | 1.7%  | 3.1%  | 1.9%  | 1.5%  | 1.6%  | 1.8%  | 2.7%  | 6.9%  |
| B2   | 38255   | 0.1%  | 0.0%  |       |       | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.1%  | 0.3%  | 0.4%  | 1.4%  | 1.1%  | 0.6%  | 82.6% | 1.5%  | 1.7%  | 1.7%  | 0.6%  | 1.6%  | 1.1%  | 5.1%  |
| B3   | 24304   | 0.0%  |       | 0.0%  |       | 0.1%  |       |       | 0.0%  |       | 0.1%  | 0.1%  | 0.3%  | 0.5%  | 0.4%  | 0.5%  | 78.3% | 2.8%  | 4.0%  | 2.1%  | 3.0%  | 2.1%  | 5.7%  |
| Caa1 | 8796    | 0.1%  |       |       |       |       |       |       |       |       | 0.1%  |       | 0.1%  | 0.1%  | 1.3%  |       | 0.5%  | 71.9% | 3.3%  | 3.9%  | 6.7%  | 5.4%  | 6.5%  |
| Caa2 | 10151   | 0.1%  |       |       |       |       |       |       |       |       |       | 0.2%  | 0.2%  |       |       | 0.2%  | 0.8%  | 2.7%  | 67.2% | 4.0%  | 9.1%  | 6.9%  | 8.7%  |
| Caa3 | 6922    |       |       |       |       |       |       |       | 0.0%  |       | 0.1%  |       |       | 0.4%  | 0.4%  | 0.3%  | 0.5%  |       |       | 67.9% | 7.8%  | 10.0% | 12.6% |
| Ca   | 16476   |       |       |       |       |       |       |       |       |       |       |       | 0.1%  | 0.0%  | 0.2%  |       | 0.0%  | 0.1%  |       | 0.1%  | 81.5% | 8.9%  | 9.1%  |
| C    | 18212   |       |       |       |       |       |       |       | 0.0%  |       |       |       |       |       |       |       |       |       | 0.1%  |       |       | 90.7% | 9.1%  |

|      | Total  | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1  | Caa2  | Caa3  | Ca    | C     | WR    |
|------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Aaa  | 995758 | 83.3% | 0.1%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 16.2% |
| Aa1  | 25249  | 1.8%  | 86.8% | 0.6%  | 0.7%  | 2.3%  | 1.0%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.2%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  |       | 0.0%  |       | 5.9%  |
| Aa2  | 107350 | 2.8%  | 0.6%  | 87.2% | 0.2%  | 0.4%  | 0.6%  | 0.5%  | 0.1%  | 0.2%  | 0.2%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.1%  | 0.0%  | 7.0%  |
| Aa3  | 39254  | 1.0%  | 0.8%  | 0.4%  | 84.0% | 0.5%  | 0.8%  | 1.3%  | 0.8%  | 0.9%  | 0.2%  | 0.1%  | 0.2%  | 0.2%  | 0.3%  | 0.2%  | 0.2%  | 0.2%  | 0.0%  | 0.0%  | 0.9%  | 0.1%  | 7.0%  |
| A1   | 48316  | 0.8%  | 0.4%  | 0.7%  | 3.3%  | 76.5% | 0.6%  | 1.5%  | 1.7%  | 3.3%  | 0.6%  | 0.2%  | 0.2%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.0%  | 0.1%  | 0.1%  | 9.6%  |
| A2   | 164448 | 0.4%  | 0.2%  | 0.8%  | 0.6%  | 1.0%  | 86.7% | 0.3%  | 0.6%  | 0.5%  | 0.5%  | 0.3%  | 0.2%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.1%  | 7.4%  |
| A3   | 42498  | 0.3%  | 0.1%  | 0.4%  | 0.6%  | 0.6%  | 0.4%  | 82.9% | 0.7%  | 2.0%  | 1.8%  | 1.2%  | 0.6%  | 0.4%  | 0.3%  | 0.3%  | 0.6%  | 0.1%  | 0.1%  | 0.1%  | 0.2%  | 0.3%  | 5.9%  |
| Baa1 | 42967  | 0.1%  | 0.1%  | 0.0%  | 0.1%  | 0.4%  | 0.2%  | 0.4%  | 86.2% | 1.1%  | 2.0%  | 1.4%  | 0.8%  | 0.8%  | 0.7%  | 0.4%  | 0.9%  | 0.3%  | 0.2%  | 0.1%  | 0.3%  | 0.4%  | 3.1%  |
| Baa2 | 94354  | 0.1%  | 0.0%  | 0.1%  | 0.1%  | 0.2%  | 0.8%  | 0.4%  | 1.0%  | 82.3% | 2.1%  | 1.7%  | 1.2%  | 0.8%  | 0.6%  | 0.5%  | 0.7%  | 0.2%  | 0.3%  | 0.2%  | 0.5%  | 0.6%  | 5.4%  |
| Baa3 | 57925  | 0.2%  | 0.0%  | 0.0%  | 0.1%  | 0.1%  | 0.2%  | 0.3%  | 0.4%  | 0.3%  | 81.7% | 1.7%  | 1.2%  | 1.4%  | 0.9%  | 0.8%  | 1.3%  | 0.5%  | 0.3%  | 0.5%  | 1.0%  | 1.0%  | 6.1%  |
| Ba1  | 17702  |       |       |       |       |       |       | 0.1%  |       | 0.1%  | 1.2%  | 76.3% | 1.3%  | 2.7%  | 1.5%  | 1.7%  | 2.6%  | 1.1%  | 1.1%  | 0.7%  | 1.7%  | 4.2%  | 3.6%  |
| Ba2  | 20186  | 0.1%  | 0.0%  | 0.1%  | 0.0%  | 0.1%  | 0.1%  |       | 0.2%  | 0.3%  | 0.7%  | 0.3%  | 75.0% | 0.5%  | 1.9%  | 2.3%  | 1.9%  | 1.8%  | 1.9%  | 0.9%  | 1.7%  | 5.6%  | 4.7%  |
| Ba3  | 6352   |       |       |       |       | 0.1%  | 0.0%  | 0.1%  | 0.3%  | 0.2%  | 1.2%  | 0.6%  |       | 64.8% | 1.7%  | 2.1%  | 3.6%  | 3.1%  | 2.1%  | 3.2%  | 3.6%  | 6.3%  | 6.8%  |
| B1   | 2662   |       |       |       |       |       |       |       |       |       |       |       |       |       | 61.4% | 1.3%  | 7.2%  | 5.0%  | 2.3%  | 5.2%  | 2.5%  | 11.0% | 4.0%  |
| B2   | 5982   |       |       |       |       | 0.2%  |       |       | 0.2%  |       |       |       |       | 0.4%  |       | 74.2% | 1.3%  | 4.0%  | 3.4%  | 1.4%  | 5.6%  | 6.0%  | 3.3%  |
| B3   | 3451   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 63.3% | 3.2%  | 8.2%  | 3.7%  | 7.6%  | 8.2%  | 5.9%  |
| Caa1 | 2586   |       |       |       |       |       |       |       |       | 0.2%  |       |       |       | 0.5%  |       |       |       | 67.8% | 2.4%  | 4.1%  | 10.7% | 9.0%  | 5.3%  |
| Caa2 | 2930   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 0.4%  |       | 68.2% | 1.0%  | 11.3% | 10.6% | 8.6%  |
| Caa3 | 2972   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 73.6% | 2.8%  | 11.9% | 11.7% |
| Ca   | 8061   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 0.1%  |       |       |       | 80.1% | 9.1%  | 10.7% |
| C    | 10645  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 90.2% | 9.8%  |



|      | Total  | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1  | Caa2 | Caa3  | Ca    | C     | WR    |      |
|------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|------|
| Aaa  | 506251 | 84.2% | 0.1%  | 0.1%  | 0.2%  | 0.1%  | 0.0%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.0%  | 0.0%  | 0.0%  | 14.9% |      |
| Aa1  | 10631  | 2.6%  | 76.1% | 1.2%  | 1.4%  | 5.4%  | 1.9%  |       | 0.1%  |       | 0.2%  |       | 0.0%  | 0.0%  | 0.5%  | 0.1%  | 0.0%  | 0.1%  | 0.0% |       |       |       | 10.5% |      |
| Aa2  | 34595  | 3.2%  | 0.7%  | 82.0% | 0.3%  | 0.6%  | 0.9%  | 0.7%  | 0.1%  | 0.5%  | 0.3%  | 0.2%  | 0.1%  | 0.0%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.1% | 0.0%  | 0.2%  | 0.1%  | 9.9%  |      |
| Aa3  | 22628  | 1.5%  | 1.1%  | 0.6%  | 77.5% | 0.7%  | 1.2%  | 1.8%  | 1.1%  | 1.5%  | 0.1%  | 0.1%  | 0.4%  | 0.2%  | 0.5%  | 0.3%  | 0.3%  | 0.3%  | 0.0% | 0.0%  | 1.6%  | 0.1%  | 9.2%  |      |
| A1   | 33756  | 1.1%  | 0.4%  | 0.8%  | 4.7%  | 70.5% | 0.3%  | 1.7%  | 2.1%  | 4.4%  | 0.6%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.1%  | 0.2%  | 0.0% | 0.0%  | 0.1%  | 0.1%  | 12.7% |      |
| A2   | 94438  | 0.5%  | 0.3%  | 0.4%  | 0.4%  | 1.5%  | 84.9% | 0.2%  | 0.4%  | 0.4%  | 0.4%  | 0.2%  | 0.2%  | 0.1%  | 0.1%  | 0.0%  | 0.1%  | 0.0%  | 0.0% | 0.0%  | 0.0%  | 0.1%  | 9.7%  |      |
| A3   | 13962  | 1.1%  | 0.3%  | 0.6%  | 0.7%  | 1.2%  | 1.0%  | 67.5% | 1.3%  | 4.0%  | 3.4%  | 2.2%  | 0.5%  | 0.4%  | 0.3%  | 0.4%  | 0.8%  | 0.2%  | 0.3% | 0.2%  | 0.1%  | 0.5%  | 13.0% |      |
| Baa1 | 12841  | 0.4%  | 0.2%  | 0.1%  |       | 0.5%  | 0.1%  | 0.8%  | 78.5% | 2.6%  | 3.7%  | 2.5%  | 0.7%  | 0.9%  | 1.1%  | 0.4%  | 0.4%  | 0.3%  | 0.1% | 0.1%  | 0.1%  | 0.1%  | 5.7%  |      |
| Baa2 | 32954  | 0.3%  | 0.0%  | 0.2%  | 0.2%  | 0.4%  | 0.9%  | 0.6%  | 2.7%  | 74.0% | 4.9%  | 3.2%  | 1.0%  | 0.9%  | 0.5%  | 0.6%  | 0.4%  | 0.3%  | 0.3% | 0.1%  | 0.7%  | 0.8%  | 7.2%  |      |
| Baa3 | 16192  | 0.8%  |       | 0.1%  | 0.2%  | 0.1%  | 0.6%  | 0.3%  | 1.0%  | 0.8%  | 76.4% | 2.7%  | 1.0%  | 1.6%  | 0.3%  | 0.5%  | 0.4%  | 0.5%  | 0.2% | 0.2%  | 0.7%  | 0.4%  | 11.1% |      |
| Ba1  | 5902   |       |       |       |       |       |       |       |       | 0.4%  | 2.7%  | 72.0% | 2.7%  | 4.8%  | 1.6%  | 1.9%  | 2.6%  | 0.4%  | 1.6% | 0.1%  | 0.9%  | 1.7%  | 6.6%  |      |
| Ba2  | 6740   | 0.4%  | 0.0%  |       | 0.1%  | 0.1%  | 0.2%  |       | 0.3%  | 0.1%  | 0.9%  | 0.6%  | 65.6% | 0.8%  | 2.4%  | 4.5%  | 2.2%  | 2.4%  | 2.2% | 0.9%  | 2.5%  | 6.9%  | 6.9%  |      |
| Ba3  | 4295   |       |       |       |       | 0.1%  | 0.0%  | 0.1%  | 0.2%  | 0.3%  | 1.7%  | 0.8%  |       | 61.2% | 1.9%  | 2.3%  | 3.4%  | 3.2%  | 2.7% | 2.7%  | 3.4%  | 8.4%  | 7.5%  |      |
| B1   | 1931   |       |       |       |       |       |       |       |       |       |       |       |       |       | 62.8% | 1.8%  | 9.6%  | 3.8%  | 0.6% | 4.7%  | 1.1%  | 12.6% | 3.0%  |      |
| B2   | 2701   |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 66.9% | 1.8%  | 7.7%  | 3.4% | 1.8%  | 7.9%  | 9.0%  | 1.5%  |      |
| B3   | 2615   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 68.8% | 3.7%  | 6.4% | 3.1%  | 7.6%  | 6.5%  | 4.0%  |      |
| Caa1 | 2035   |       |       |       |       |       |       |       |       | 0.2%  |       |       |       | 0.6%  |       |       |       | 64.7% | 3.0% | 5.3%  | 12.6% | 10.7% | 2.9%  |      |
| Caa2 | 1657   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 0.7%  |      | 59.9% | 0.6%  | 18.2% | 15.9% | 4.7% |
| Caa3 | 1556   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       | 69.0% | 3.4%  | 17.9% | 9.6% |
| Ca   | 4567   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       | 76.7% | 14.8% | 8.4% |
| C    | 9743   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       | 93.1% | 6.9% |

|      | Total  | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1  | Caa2  | Caa3  | Ca    | C     | WR    |
|------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Aaa  | 489445 | 82.3% | 0.0%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  |       | 0.0%  |       |       | 0.0%  |       | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 17.5% |
| Aa1  | 14618  | 1.2%  | 94.6% | 0.3%  | 0.2%  | 0.1%  | 0.4%  | 0.3%  | 0.0%  | 0.1%  | 0.1%  | 0.1%  |       | 0.0%  | 0.0%  |       |       |       |       |       | 0.0%  |       | 2.6%  |
| Aa2  | 72712  | 2.6%  | 0.5%  | 89.7% | 0.1%  | 0.3%  | 0.4%  | 0.4%  | 0.1%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 5.6%  |
| Aa3  | 16626  | 0.3%  | 0.4%  | 0.2%  | 92.8% | 0.2%  | 0.3%  | 0.6%  | 0.4%  | 0.1%  | 0.3%  | 0.1%  | 0.0%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.1%  | 0.0%  | 4.0%  |
| A1   | 14543  | 0.2%  | 0.2%  | 0.4%  | 0.2%  | 90.4% | 1.2%  | 1.2%  | 0.8%  | 0.8%  | 0.6%  | 0.3%  | 0.2%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.0%  | 0.3%  | 0.0%  | 0.2%  | 0.1%  | 2.6%  |
| A2   | 69967  | 0.3%  | 0.2%  | 1.3%  | 0.8%  | 0.3%  | 89.1% | 0.4%  | 0.9%  | 0.7%  | 0.6%  | 0.3%  | 0.2%  | 0.2%  | 0.1%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 4.4%  |
| A3   | 28536  |       | 0.0%  | 0.3%  | 0.5%  | 0.4%  | 0.1%  | 90.5% | 0.5%  | 1.0%  | 1.1%  | 0.6%  | 0.6%  | 0.5%  | 0.3%  | 0.2%  | 0.5%  | 0.0%  | 0.1%  | 0.0%  | 0.2%  | 0.2%  | 2.4%  |
| Baa1 | 30126  | 0.0%  |       |       | 0.2%  | 0.4%  | 0.2%  | 0.2%  | 89.5% | 0.5%  | 1.4%  | 1.0%  | 0.8%  | 0.7%  | 0.5%  | 0.4%  | 1.1%  | 0.2%  | 0.2%  | 0.1%  | 0.3%  | 0.4%  | 1.9%  |
| Baa2 | 61400  | 0.0%  | 0.0%  | 0.1%  | 0.0%  | 0.2%  | 0.7%  | 0.4%  | 0.2%  | 86.8% | 0.6%  | 1.0%  | 1.3%  | 0.8%  | 0.7%  | 0.5%  | 0.9%  | 0.2%  | 0.3%  | 0.2%  | 0.5%  | 0.4%  | 4.4%  |
| Baa3 | 41733  | 0.0%  | 0.0%  |       | 0.0%  | 0.1%  | 0.1%  | 0.3%  | 0.2%  | 0.1%  | 83.8% | 1.3%  | 1.2%  | 1.4%  | 1.1%  | 0.9%  | 1.7%  | 0.4%  | 0.3%  | 0.7%  | 1.1%  | 1.2%  | 4.2%  |
| Ba1  | 11800  |       |       |       |       |       |       | 0.1%  |       |       | 0.5%  | 78.5% | 0.6%  | 1.6%  | 1.5%  | 1.7%  | 2.6%  | 1.4%  | 0.9%  | 1.0%  | 2.1%  | 5.4%  | 2.1%  |
| Ba2  | 13446  |       |       | 0.1%  |       | 0.1%  |       |       | 0.1%  | 0.4%  | 0.5%  | 0.1%  | 79.7% | 0.4%  | 1.6%  | 1.2%  | 1.7%  | 1.5%  | 1.7%  | 0.8%  | 1.3%  | 5.0%  | 3.7%  |
| Ba3  | 2057   |       |       |       |       |       |       |       | 0.6%  |       |       |       |       | 72.4% | 1.2%  | 1.8%  | 4.1%  | 3.1%  | 0.9%  | 4.4%  | 4.0%  | 2.1%  | 5.6%  |
| B1   | 731    |       |       |       |       |       |       |       |       |       |       |       |       |       | 57.7% |       | 0.8%  | 8.2%  | 6.8%  | 6.7%  | 6.2%  | 6.8%  | 6.7%  |
| B2   | 3281   |       |       |       |       | 0.4%  |       |       | 0.4%  |       |       |       |       | 0.8%  |       | 80.2% | 0.8%  | 0.9%  | 3.5%  | 1.1%  | 3.7%  | 3.5%  | 4.7%  |
| B3   | 836    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 46.1% | 1.4%  | 14.0% | 5.7%  | 7.5%  | 13.5% | 11.7% |
| Caa1 | 551    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 79.5% |       |       | 3.6%  | 2.7%  | 14.2% |
| Caa2 | 1273   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 79.0% | 1.4%  | 2.2%  | 3.7%  | 13.7% |
| Caa3 | 1416   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 78.5% | 2.2%  | 5.3%  | 14.0% |
| Ca   | 3494   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 84.5% | 1.8%  | 13.7% |
| C    | 902    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 58.5% | 41.5% |

|      | Total   | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1  | Caa2  | Caa3  | Ca    | C     | WR    |       |
|------|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Aaa  | 1489123 | 86.4% | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  |       | 0.0%  |       |       |       |       |       |       |       |       |       |       |       |       | 13.4% |       |
| Aa1  | 88027   | 10.5% | 80.1% | 0.1%  | 0.0%  | 0.1%  |       | 0.0%  |       | 0.0%  | 0.0%  |       |       | 0.0%  |       |       |       |       |       |       |       |       |       | 9.2%  |
| Aa2  | 132551  | 5.8%  | 1.7%  | 82.8% | 0.7%  | 0.3%  | 0.4%  | 0.2%  | 0.0%  | 0.1%  | 0.0%  |       | 0.0%  |       | 0.0%  |       |       | 0.0%  |       | 0.0%  |       |       |       | 8.0%  |
| Aa3  | 34160   | 4.7%  | 2.4%  | 1.8%  | 80.3% | 1.7%  | 0.9%  | 0.5%  | 0.3%  | 0.2%  | 0.2%  | 0.0%  | 0.0%  |       |       |       |       |       |       |       |       |       |       | 7.1%  |
| A1   | 17293   | 2.3%  | 1.2%  | 2.2%  | 1.1%  | 77.7% | 3.6%  | 1.4%  | 0.5%  | 0.5%  | 0.2%  | 0.1%  | 0.0%  |       | 0.0%  | 0.0%  |       | 0.0%  |       |       |       |       |       | 9.1%  |
| A2   | 57835   | 1.0%  | 0.5%  | 4.0%  | 1.3%  | 1.1%  | 83.1% | 0.2%  | 0.3%  | 0.4%  | 0.5%  | 0.1%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  |       |       | 0.0%  |       | 7.2%  |
| A3   | 21538   | 2.0%  | 0.2%  | 0.7%  | 3.0%  | 1.2%  | 1.1%  | 82.8% | 0.7%  | 1.5%  | 0.7%  | 0.3%  | 0.2%  | 0.3%  | 0.1%  | 0.0%  | 0.0%  | 0.1%  |       | 0.0%  |       |       |       | 5.2%  |
| Baa1 | 10499   | 0.6%  |       | 0.2%  | 0.2%  | 1.7%  | 1.9%  | 1.3%  | 83.6% | 0.7%  | 1.3%  | 1.0%  | 0.5%  | 0.5%  | 0.2%  | 0.2%  | 0.2%  | 0.1%  | 0.2%  | 0.1%  | 0.2%  | 0.0%  |       | 5.4%  |
| Baa2 | 51573   | 0.4%  | 0.1%  | 0.3%  | 0.3%  | 0.5%  | 3.3%  | 1.3%  | 0.9%  | 84.4% | 0.3%  | 0.6%  | 0.3%  | 0.2%  | 0.2%  | 0.2%  | 0.3%  | 0.0%  | 0.1%  | 0.0%  | 0.1%  | 0.0%  |       | 6.2%  |
| Baa3 | 30323   | 0.3%  | 0.1%  | 0.2%  | 0.1%  | 0.5%  | 0.6%  | 1.7%  | 0.6%  | 0.4%  | 85.4% | 0.2%  | 0.6%  | 0.7%  | 0.4%  | 0.2%  | 0.5%  | 0.2%  | 0.4%  | 0.0%  | 0.2%  | 0.2%  |       | 6.8%  |
| Ba1  | 5667    | 0.4%  |       |       |       | 0.0%  | 1.2%  | 0.3%  | 1.0%  | 1.9%  | 1.7%  | 80.5% | 0.4%  | 0.8%  | 0.8%  | 0.1%  | 1.8%  | 0.3%  | 0.3%  | 0.1%  | 0.3%  | 0.1%  |       | 7.9%  |
| Ba2  | 24725   | 0.1%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.3%  | 0.4%  | 0.6%  | 3.8%  | 1.4%  | 1.7%  | 84.1% | 0.2%  | 0.1%  | 0.3%  | 0.6%  | 0.3%  | 0.3%  | 0.1%  | 0.2%  | 0.2%  |       | 5.2%  |
| Ba3  | 8343    | 0.1%  |       |       | 0.1%  | 0.6%  | 0.4%  | 0.5%  | 0.3%  | 0.9%  | 2.5%  | 1.5%  | 0.6%  | 81.1% | 0.0%  | 0.4%  | 0.9%  | 0.3%  | 2.0%  | 0.5%  | 0.5%  | 0.3%  |       | 6.3%  |
| B1   | 2475    |       |       |       |       |       |       |       |       | 0.5%  |       |       | 1.4%  | 0.8%  | 82.0% | 0.5%  | 2.3%  | 0.8%  | 0.9%  | 0.1%  | 0.8%  |       |       | 9.9%  |
| B2   | 13689   |       | 0.1%  |       |       |       | 0.1%  |       |       | 0.2%  | 0.2%  | 1.0%  | 2.8%  | 1.8%  | 0.8%  | 84.8% | 0.3%  | 0.2%  | 0.3%  | 0.3%  | 0.7%  | 0.2%  |       | 6.4%  |
| B3   | 5625    |       |       |       |       | 0.3%  |       |       | 0.2%  |       | 0.4%  |       | 0.2%  | 1.5%  | 0.4%  | 0.2%  | 82.8% | 1.7%  | 2.4%  | 0.8%  | 1.6%  | 0.6%  |       | 6.8%  |
| Caa1 | 2450    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 92.7% |       |       | 2.6%  | 0.2%  |       | 4.5%  |
| Caa2 | 1543    |       |       |       |       |       |       |       |       |       |       |       | 0.8%  |       |       |       |       | 9.7%  | 73.1% | 2.9%  | 1.3%  | 2.2%  |       | 10.0% |
| Caa3 | 505     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 77.8% | 0.8%  |       |       | 21.4% |
| Ca   | 1233    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 82.6% | 0.9%  |       | 16.5% |
| C    | 576     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 80.7% |       | 19.3% |

|      | Total  | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1  | Caa2  | Caa3  | Ca    | C     | WR    |       |
|------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Aaa  | 130061 | 90.0% | 0.2%  | 0.1%  | 0.1%  | 0.0%  |       |       |       |       |       |       |       |       |       |       | 0.0%  |       |       |       |       |       | 9.5%  |       |
| Aa1  | 7241   | 31.0% | 52.8% | 1.9%  | 0.2%  | 0.4%  | 0.0%  |       | 0.1%  |       | 0.2%  |       |       | 0.1%  |       |       |       |       |       |       |       |       |       | 13.3% |
| Aa2  | 32714  | 13.1% | 4.3%  | 74.2% | 0.5%  | 0.2%  | 0.1%  | 0.1%  | 0.0%  | 0.1%  | 0.1%  |       |       | 0.0%  |       |       | 0.1%  |       | 0.0%  |       |       |       |       | 7.3%  |
| Aa3  | 9962   | 13.9% | 5.4%  | 7.3%  | 65.3% | 0.7%  | 0.2%  | 0.9%  |       |       | 0.0%  |       |       |       | 0.2%  |       |       |       |       | 0.1%  |       |       |       | 6.0%  |
| A1   | 7913   | 11.7% | 4.7%  | 5.2%  | 5.8%  | 60.2% | 0.4%  | 0.8%  | 0.4%  | 0.1%  | 0.2%  | 0.2%  |       | 0.2%  | 0.0%  |       |       |       |       |       |       |       |       | 10.0% |
| A2   | 26284  | 3.0%  | 2.3%  | 3.8%  | 4.2%  | 5.5%  | 74.3% | 0.8%  | 0.4%  | 0.3%  | 0.1%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  |       |       |       |       |       |       |       |       | 5.2%  |
| A3   | 16917  | 2.4%  | 1.4%  | 2.3%  | 3.5%  | 4.9%  | 5.9%  | 72.2% | 0.7%  | 0.8%  | 0.7%  |       | 0.1%  | 0.1%  |       | 0.0%  |       |       |       |       |       |       |       | 4.9%  |
| Baa1 | 13907  | 2.0%  | 0.4%  | 1.1%  | 1.5%  | 2.7%  | 4.4%  | 5.2%  | 70.6% | 0.7%  | 0.8%  | 0.7%  | 0.2%  | 0.5%  | 0.4%  |       |       |       |       | 0.1%  |       |       |       | 8.7%  |
| Baa2 | 29191  | 0.8%  | 0.2%  | 0.7%  | 0.6%  | 1.0%  | 2.7%  | 3.9%  | 4.8%  | 76.5% | 0.7%  | 0.6%  | 0.4%  | 0.2%  | 0.2%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  |       |       | 0.0%  | 0.0%  | 6.6%  |
| Baa3 | 26842  | 0.4%  |       | 0.2%  | 0.3%  | 0.7%  | 0.5%  | 1.2%  | 3.2%  | 4.8%  | 76.9% | 0.8%  | 0.8%  | 0.9%  | 0.1%  | 0.2%  | 0.1%  | 0.0%  | 0.2%  |       |       | 0.2%  |       | 8.4%  |
| Ba1  | 12212  | 0.4%  |       | 0.1%  | 0.0%  | 0.2%  | 0.3%  | 0.8%  | 0.7%  | 1.4%  | 4.5%  | 84.1% | 1.0%  | 0.9%  | 0.5%  | 0.1%  | 0.2%  | 0.1%  | 0.0%  |       |       |       |       | 4.6%  |
| Ba2  | 16969  | 0.2%  |       |       |       | 0.2%  | 0.1%  | 0.1%  | 0.2%  | 1.1%  | 1.3%  | 3.6%  | 86.1% | 1.5%  | 1.0%  | 0.4%  | 0.6%  | 0.0%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  |       | 3.7%  |
| Ba3  | 13578  | 0.1%  |       |       |       |       | 0.0%  | 0.0%  | 0.1%  | 0.1%  | 1.3%  | 1.1%  | 2.4%  | 87.4% | 1.8%  | 1.2%  | 0.7%  | 0.3%  | 0.1%  |       |       | 0.1%  |       | 3.3%  |
| B1   | 9347   | 0.1%  |       |       |       |       |       |       |       | 0.0%  | 0.4%  | 0.2%  | 0.6%  | 1.0%  | 89.3% | 1.7%  | 2.2%  | 0.8%  | 0.3%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 2.9%  |
| B2   | 14078  | 0.2%  |       |       |       |       | 0.0%  | 0.0%  | 0.0%  |       | 0.1%  | 0.1%  | 0.8%  | 0.7%  | 0.6%  | 88.0% | 3.1%  | 2.2%  | 1.5%  | 0.2%  | 0.2%  | 0.1%  | 0.1%  | 2.1%  |
| B3   | 11921  | 0.0%  |       | 0.1%  |       |       |       |       |       |       | 0.1%  | 0.0%  | 0.0%  | 0.1%  | 0.4%  | 0.7%  | 86.9% | 3.5%  | 3.2%  | 1.0%  | 1.1%  | 0.3%  | 0.1%  | 2.5%  |
| Caa1 | 1572   | 0.4%  |       |       |       |       |       |       |       |       |       |       |       |       | 0.4%  |       | 0.6%  | 67.4% | 9.7%  | 6.6%  | 4.8%  | 4.3%  | 5.6%  |       |
| Caa2 | 2960   |       |       |       |       |       |       |       |       |       |       |       | 0.2%  |       |       | 0.4%  | 0.6%  | 1.5%  | 72.2% | 6.8%  | 8.4%  | 5.1%  | 4.9%  |       |
| Caa3 | 598    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 64.9% | 11.9% | 15.4% | 7.9%  |       |
| Ca   | 1129   |       |       |       |       |       |       |       |       |       |       |       |       |       | 0.5%  |       |       | 0.5%  |       |       | 70.9% | 20.2% | 7.8%  |       |
| C    | 664    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 74.4% | 25.6% |       |

|      | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2   | B3    | Caa1  | Caa2  | Caa3  | Ca    | C     | WR    |      |      |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|------|------|
| Aaa  | 95654 | 91.3% | 0.4%  | 0.4%  | 0.3%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0% | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 7.1%  |      |      |
| Aa1  | 7291  | 2.7%  | 84.7% | 1.3%  | 0.8%  | 0.6%  | 0.9%  | 0.5%  | 0.1%  | 0.1%  | 0.3%  | 0.1%  |       | 0.1%  | 0.0%  | 0.1% |       |       |       |       |       |       | 7.8%  |      |      |
| Aa2  | 30809 | 1.2%  | 0.6%  | 87.1% | 1.4%  | 1.1%  | 0.5%  | 0.6%  | 0.4%  | 0.3%  | 0.4%  | 0.1%  | 0.1%  | 0.0%  | 0.1%  | 0.0% | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 6.0%  |      |      |
| Aa3  | 8998  | 2.1%  | 0.1%  | 0.5%  | 77.1% | 3.2%  | 1.9%  | 2.2%  | 1.2%  | 0.4%  | 1.4%  | 0.5%  | 0.5%  | 0.4%  | 0.1%  | 0.0% | 0.1%  | 0.1%  |       | 0.0%  | 0.0%  | 0.0%  | 8.3%  |      |      |
| A1   | 6293  | 2.1%  | 0.7%  | 2.2%  | 0.8%  | 78.4% | 1.0%  | 1.3%  | 1.3%  | 1.2%  | 1.3%  | 0.4%  | 0.0%  | 0.0%  | 0.1%  | 0.0% | 0.5%  | 0.0%  | 0.0%  |       |       | 0.0%  | 8.6%  |      |      |
| A2   | 23884 | 0.5%  | 0.1%  | 0.2%  | 0.3%  | 0.4%  | 88.8% | 0.7%  | 0.3%  | 0.5%  | 0.5%  | 0.3%  | 0.3%  | 0.1%  | 0.1%  | 0.0% | 0.1%  | 0.0%  | 0.1%  | 0.1%  | 0.1%  | 0.0%  | 6.5%  |      |      |
| A3   | 18913 | 0.7%  | 0.3%  | 0.4%  | 0.8%  | 0.3%  | 0.3%  | 85.1% | 0.7%  | 1.2%  | 1.1%  | 0.6%  | 0.6%  | 0.3%  | 0.5%  | 0.2% | 0.1%  | 0.2%  | 0.1%  | 0.2%  | 0.1%  | 0.1%  | 6.0%  |      |      |
| Baa1 | 5517  | 1.2%  | 0.5%  |       | 0.1%  | 0.9%  | 0.7%  | 0.2%  | 78.9% | 0.5%  | 2.0%  | 1.8%  | 0.5%  | 0.7%  | 0.5%  | 0.1% | 0.4%  | 0.0%  | 0.4%  | 0.1%  | 0.3%  | 0.1%  | 10.1% |      |      |
| Baa2 | 42765 | 0.1%  | 0.0%  | 0.2%  | 0.2%  | 0.1%  | 0.2%  | 0.2%  | 0.2%  | 86.1% | 1.2%  | 1.2%  | 0.7%  | 0.7%  | 0.7%  | 0.5% | 0.6%  | 0.2%  | 0.5%  | 0.5%  | 0.4%  | 0.2%  | 5.5%  |      |      |
| Baa3 | 15435 | 0.3%  | 0.2%  | 0.0%  | 0.3%  | 0.0%  | 0.3%  | 0.4%  | 0.3%  | 0.1%  | 78.4% | 1.9%  | 1.7%  | 2.6%  | 2.3%  | 0.8% | 0.8%  | 0.4%  | 0.5%  | 0.6%  | 0.9%  | 0.3%  | 6.8%  |      |      |
| Ba1  | 4505  | 0.3%  | 0.3%  |       | 0.3%  |       | 0.3%  | 0.0%  | 1.5%  | 0.5%  | 0.3%  | 71.2% | 2.1%  | 1.0%  | 3.5%  | 1.8% | 1.3%  | 0.6%  | 2.8%  | 1.5%  | 2.2%  | 0.3%  | 8.5%  |      |      |
| Ba2  | 18775 |       |       |       | 0.1%  | 0.0%  | 0.1%  | 0.1%  | 0.2%  | 0.2%  | 0.7%  | 0.2%  | 83.4% | 1.0%  | 1.0%  | 1.0% | 0.7%  | 0.9%  | 0.5%  | 0.9%  | 0.8%  | 0.7%  | 7.6%  |      |      |
| Ba3  | 10799 |       |       |       |       |       | 0.4%  | 0.1%  |       | 0.0%  | 0.6%  | 0.2%  | 0.4%  | 77.7% | 1.8%  | 0.8% | 1.6%  | 1.4%  | 1.8%  | 0.9%  | 2.4%  | 1.8%  | 8.1%  |      |      |
| B1   | 3465  |       |       |       | 0.3%  | 0.3%  | 0.0%  | 0.1%  | 0.2%  | 0.3%  | 0.3%  | 0.7%  | 1.0%  |       | 60.5% | 2.7% | 3.4%  | 3.4%  | 4.5%  | 4.0%  | 6.5%  | 5.8%  | 5.8%  |      |      |
| B2   | 3407  |       |       |       |       |       |       |       |       |       |       |       | 1.1%  |       | 0.7%  | 0.6% | 0.7%  | 73.0% | 0.3%  | 2.3%  | 4.6%  | 2.0%  | 3.9%  | 1.1% | 9.8% |
| B3   | 2318  |       |       |       |       |       |       |       |       |       |       | 0.9%  | 2.1%  | 0.9%  | 0.4%  | 0.5% | 56.2% | 1.6%  | 6.1%  | 7.5%  | 10.4% | 6.2%  | 7.2%  |      |      |
| Caa1 | 1491  |       |       |       |       |       |       |       |       |       | 0.4%  |       | 0.8%  |       | 0.8%  |      | 1.6%  | 62.6% | 0.7%  | 6.6%  | 10.7% | 10.4% | 5.4%  |      |      |
| Caa2 | 2143  |       |       |       |       |       |       |       |       |       |       | 0.9%  |       |       | 0.6%  | 1.7% |       |       | 57.9% | 4.7%  | 14.2% | 9.6%  | 10.5% |      |      |
| Caa3 | 2178  |       |       |       |       |       |       |       | 0.1%  |       | 0.4%  |       |       |       | 1.2%  | 1.3% | 0.4%  | 1.1%  |       | 60.2% | 16.2% | 10.7% | 8.3%  |      |      |
| Ca   | 5272  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       | 0.2%  |       |       | 85.8% | 8.8%  | 4.9%  |      |      |
| C    | 5956  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       | 0.4%  |       |       | 95.4% | 4.2%  |      |      |

## Matrices by Original Rating

| 1-year        | Aaa           | Aa            | A             | Baa           | Ba            | B             | Caa and below | WR     |
|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|--------|
| Aaa           | <b>95.08%</b> | 0.20%         | 0.03%         | 0.02%         | 0.01%         | 0.01%         | 0.02%         | 4.63%  |
| Aa            | 0.85%         | <b>96.61%</b> | 0.90%         | 0.25%         | 0.10%         | 0.06%         | 0.17%         | 1.06%  |
| A             | 0.13%         | 0.58%         | <b>94.01%</b> | 2.24%         | 1.04%         | 0.47%         | 0.35%         | 1.18%  |
| Baa           | 0.05%         | 0.03%         | 0.29%         | <b>94.41%</b> | 1.55%         | 1.15%         | 1.77%         | 0.74%  |
| Ba            | 0.00%         | 0.02%         | 0.00%         | 0.39%         | <b>93.26%</b> | 1.47%         | 3.95%         | 0.91%  |
| B             | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.69%         | <b>94.93%</b> | 0.46%         | 3.92%  |
| Caa and below | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | <b>89.47%</b> | 10.53% |

| 2-year        | Aaa           | Aa            | A             | Baa           | Ba            | B             | Caa and below | WR     |
|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|--------|
| Aaa           | <b>83.21%</b> | 0.34%         | 0.03%         | 0.02%         | 0.02%         | 0.00%         | 0.03%         | 16.35% |
| Aa            | 3.87%         | <b>89.51%</b> | 1.78%         | 0.34%         | 0.04%         | 0.04%         | 0.13%         | 4.29%  |
| A             | 0.73%         | 2.93%         | <b>88.93%</b> | 3.04%         | 0.41%         | 0.14%         | 0.22%         | 3.59%  |
| Baa           | 0.23%         | 0.24%         | 1.94%         | <b>89.70%</b> | 2.12%         | 0.69%         | 0.67%         | 4.41%  |
| Ba            | 0.00%         | 0.08%         | 0.11%         | 2.42%         | <b>88.42%</b> | 2.92%         | 2.39%         | 3.66%  |
| B             | 0.07%         | 0.00%         | 0.07%         | 0.28%         | 2.51%         | <b>89.82%</b> | 1.60%         | 5.65%  |
| Caa and below | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | <b>71.88%</b> | 28.13% |

| 3-year        | Aaa           | Aa            | A             | Baa           | Ba            | B             | Caa and below | WR     |
|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|--------|
| Aaa           | <b>68.25%</b> | 0.56%         | 0.12%         | 0.05%         | 0.04%         | 0.03%         | 0.03%         | 30.91% |
| Aa            | 8.73%         | <b>73.85%</b> | 2.69%         | 1.57%         | 0.35%         | 0.04%         | 0.22%         | 12.56% |
| A             | 2.13%         | 5.38%         | <b>75.63%</b> | 4.33%         | 1.31%         | 0.33%         | 0.65%         | 10.23% |
| Baa           | 0.68%         | 1.06%         | 4.26%         | <b>75.77%</b> | 3.18%         | 1.70%         | 1.99%         | 11.36% |
| Ba            | 0.04%         | 0.15%         | 1.38%         | 4.86%         | <b>75.52%</b> | 3.62%         | 6.09%         | 8.33%  |
| B             | 0.09%         | 0.09%         | 0.26%         | 0.34%         | 5.08%         | <b>78.66%</b> | 6.37%         | 9.12%  |
| Caa and below | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 2.00%         | 0.00%         | <b>64.00%</b> | 34.00% |

| 4-year        | Aaa           | Aa            | A             | Baa           | Ba            | B             | Caa and below | WR     |
|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|--------|
| Aaa           | <b>56.98%</b> | 0.70%         | 0.22%         | 0.08%         | 0.08%         | 0.06%         | 0.09%         | 41.80% |
| Aa            | 14.16%        | <b>57.00%</b> | 3.61%         | 2.17%         | 0.94%         | 0.32%         | 0.59%         | 21.20% |
| A             | 2.70%         | 8.52%         | <b>57.58%</b> | 5.12%         | 2.40%         | 0.59%         | 1.65%         | 21.43% |
| Baa           | 0.80%         | 1.42%         | 6.36%         | <b>55.73%</b> | 5.04%         | 2.88%         | 5.59%         | 22.18% |
| Ba            | 0.15%         | 0.34%         | 1.99%         | 6.22%         | <b>59.35%</b> | 4.13%         | 10.44%        | 17.39% |
| B             | 0.00%         | 0.11%         | 0.22%         | 0.44%         | 6.10%         | <b>65.47%</b> | 12.75%        | 14.92% |
| Caa and below | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 2.50%         | 0.00%         | <b>72.50%</b> | 25.00% |

| 5-year        | Aaa           | Aa            | A             | Baa           | Ba            | B             | Caa and below | WR     |
|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|--------|
| Aaa           | <b>45.42%</b> | 0.54%         | 0.22%         | 0.12%         | 0.10%         | 0.11%         | 0.17%         | 53.31% |
| Aa            | 16.44%        | <b>44.09%</b> | 4.11%         | 2.69%         | 0.97%         | 0.65%         | 1.21%         | 29.84% |
| A             | 3.44%         | 7.42%         | <b>46.00%</b> | 5.03%         | 3.07%         | 0.71%         | 2.54%         | 31.78% |
| Baa           | 1.13%         | 1.67%         | 5.58%         | <b>43.05%</b> | 5.18%         | 3.01%         | 8.75%         | 31.63% |
| Ba            | 0.12%         | 0.42%         | 2.32%         | 6.08%         | <b>49.17%</b> | 4.23%         | 12.75%        | 24.91% |
| B             | 0.00%         | 0.00%         | 0.14%         | 0.41%         | 5.19%         | <b>56.69%</b> | 17.49%        | 20.08% |
| Caa and below | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 2.70%         | 2.70%         | <b>70.27%</b> | 24.32% |

### For WR Ratings in the 5-year cohort

#### Rating before WR

| Original Rating | Aaa           | Aa            | A             | Baa           | Ba            | B             | Caa and below | WR    |
|-----------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|-------|
| Aaa             | <b>98.89%</b> | 0.85%         | 0.12%         | 0.03%         | 0.01%         | 0.01%         | 0.11%         | 0.00% |
| Aa              | 21.48%        | <b>71.64%</b> | 3.52%         | 1.84%         | 0.27%         | 0.22%         | 1.03%         | 0.00% |
| A               | 8.22%         | 13.12%        | <b>71.28%</b> | 4.23%         | 1.51%         | 0.54%         | 1.09%         | 0.00% |
| Baa             | 4.22%         | 4.65%         | 9.22%         | <b>70.76%</b> | 5.36%         | 2.22%         | 3.57%         | 0.00% |
| Ba              | 0.48%         | 1.20%         | 5.98%         | 9.57%         | <b>66.75%</b> | 6.70%         | 9.33%         | 0.00% |
| B               | 1.36%         | 0.00%         | 1.36%         | 6.80%         | 20.41%        | <b>44.90%</b> | 25.17%        | 0.00% |
| Caa and below   | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 11.11%        | 0.00%         | <b>88.89%</b> | 0.00% |

| 1-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR    |
|---------------|--------|--------|--------|--------|--------|--------|---------------|-------|
| Aaa           | 97.14% | 0.16%  | 0.01%  | 0.02%  | 0.00%  | 0.01%  | 0.04%         | 2.62% |
| Aa            | 0.17%  | 97.65% | 0.84%  | 0.42%  | 0.11%  | 0.06%  | 0.24%         | 0.51% |
| A             | 0.04%  | 0.43%  | 92.23% | 2.96%  | 1.55%  | 0.88%  | 0.25%         | 1.67% |
| Baa           | 0.00%  | 0.00%  | 0.09%  | 92.43% | 1.96%  | 2.10%  | 3.22%         | 0.18% |
| Ba            | 0.00%  | 0.00%  | 0.00%  | 0.45%  | 84.99% | 3.22%  | 10.82%        | 0.52% |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 97.25% | 1.83%         | 0.92% |
| Caa and below | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 100.00%       | 0.00% |

| 2-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR     |
|---------------|--------|--------|--------|--------|--------|--------|---------------|--------|
| Aaa           | 82.49% | 0.28%  | 0.04%  | 0.00%  | 0.06%  | 0.01%  | 0.07%         | 17.05% |
| Aa            | 1.18%  | 93.36% | 1.52%  | 0.70%  | 0.03%  | 0.03%  | 0.44%         | 2.75%  |
| A             | 0.34%  | 2.39%  | 89.44% | 3.86%  | 0.28%  | 0.14%  | 0.24%         | 3.31%  |
| Baa           | 0.08%  | 0.11%  | 0.90%  | 92.79% | 2.25%  | 0.86%  | 0.74%         | 2.27%  |
| Ba            | 0.00%  | 0.00%  | 0.00%  | 1.38%  | 82.38% | 7.43%  | 6.05%         | 2.76%  |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 94.44% | 4.44%         | 1.11%  |
| Caa and below | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 100.00%       | 0.00%  |

| 3-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR     |
|---------------|--------|--------|--------|--------|--------|--------|---------------|--------|
| Aaa           | 65.20% | 0.57%  | 0.20%  | 0.05%  | 0.11%  | 0.08%  | 0.10%         | 33.70% |
| Aa            | 3.48%  | 79.78% | 2.37%  | 3.55%  | 0.51%  | 0.08%  | 0.79%         | 9.44%  |
| A             | 1.59%  | 4.10%  | 75.50% | 6.22%  | 1.54%  | 0.32%  | 0.81%         | 9.93%  |
| Baa           | 0.81%  | 0.75%  | 2.85%  | 80.34% | 3.82%  | 2.00%  | 2.44%         | 6.98%  |
| Ba            | 0.22%  | 0.00%  | 0.43%  | 2.58%  | 65.59% | 5.38%  | 15.91%        | 9.89%  |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 65.82% | 24.05%        | 10.13% |
| Caa and below | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 100.00%       | 0.00%  |

| 4-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR     |
|---------------|--------|--------|--------|--------|--------|--------|---------------|--------|
| Aaa           | 55.69% | 0.67%  | 0.27%  | 0.11%  | 0.18%  | 0.16%  | 0.23%         | 42.69% |
| Aa            | 6.59%  | 61.45% | 4.16%  | 4.64%  | 1.78%  | 0.59%  | 1.94%         | 18.84% |
| A             | 0.95%  | 6.49%  | 58.26% | 6.82%  | 3.26%  | 0.65%  | 1.96%         | 21.61% |
| Baa           | 0.43%  | 0.72%  | 2.94%  | 57.25% | 8.14%  | 4.58%  | 7.47%         | 18.46% |
| Ba            | 0.00%  | 1.01%  | 0.67%  | 3.02%  | 42.28% | 4.70%  | 26.17%        | 22.15% |
| B             | 0.00%  | 0.00%  | 1.35%  | 0.00%  | 1.35%  | 47.30% | 24.32%        | 25.68% |
| Caa and below | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 100.00%       | 0.00%  |

| 5-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR     |
|---------------|--------|--------|--------|--------|--------|--------|---------------|--------|
| Aaa           | 46.24% | 0.52%  | 0.24%  | 0.19%  | 0.20%  | 0.25%  | 0.48%         | 51.88% |
| Aa            | 5.29%  | 47.80% | 5.29%  | 6.87%  | 1.30%  | 1.44%  | 3.50%         | 28.50% |
| A             | 1.24%  | 4.48%  | 46.44% | 7.08%  | 4.55%  | 0.83%  | 2.86%         | 32.52% |
| Baa           | 0.50%  | 0.50%  | 1.71%  | 41.77% | 8.20%  | 4.99%  | 13.19%        | 29.15% |
| Ba            | 0.00%  | 0.75%  | 0.00%  | 2.62%  | 32.96% | 4.12%  | 31.84%        | 27.72% |
| B             | 0.00%  | 0.00%  | 1.43%  | 0.00%  | 4.29%  | 38.57% | 17.14%        | 38.57% |
| Caa and below | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 100.00%       | 0.00%  |

For WR Ratings in the 5-year cohort

Rating before WR

| Original Rating | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR    |
|-----------------|--------|--------|--------|--------|--------|--------|---------------|-------|
| Aaa             | 98.96% | 0.66%  | 0.12%  | 0.05%  | 0.02%  | 0.00%  | 0.20%         | 0.00% |
| Aa              | 12.77% | 72.53% | 5.30%  | 5.06%  | 0.24%  | 0.24%  | 3.86%         | 0.00% |
| A               | 5.21%  | 11.34% | 76.04% | 5.44%  | 0.35%  | 0.23%  | 1.39%         | 0.00% |
| Baa             | 6.36%  | 3.42%  | 5.62%  | 75.79% | 1.22%  | 1.47%  | 6.11%         | 0.00% |
| Ba              | 0.00%  | 1.35%  | 1.35%  | 4.05%  | 75.68% | 5.41%  | 12.16%        | 0.00% |
| B               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 22.22% | 77.78%        | 0.00% |
| Caa and below   |        |        |        |        |        |        |               |       |

| <b>1-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
|---------------|------------|-----------|----------|------------|-----------|----------|----------------------|-----------|
| Aaa           | 97.34%     | 0.10%     | 0.00%    | 0.02%      | 0.00%     | 0.02%    | 0.09%                | 2.43%     |
| Aa            | 0.60%      | 95.40%    | 1.28%    | 0.17%      | 0.09%     | 0.00%    | 0.77%                | 1.70%     |
| A             | 0.10%      | 1.04%     | 91.11%   | 3.36%      | 0.07%     | 0.07%    | 0.07%                | 4.19%     |
| Baa           | 0.00%      | 0.00%     | 0.35%    | 96.99%     | 1.86%     | 0.35%    | 0.27%                | 0.18%     |
| Ba            | 0.00%      | 0.00%     | 0.00%    | 2.47%      | 91.77%    | 3.29%    | 1.23%                | 1.23%     |
| B             | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 94.87%   | 5.13%                | 0.00%     |
| Caa and below | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 0.00%    | 100.00%              | 0.00%     |
| <b>2-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 86.56%     | 0.60%     | 0.09%    | 0.01%      | 0.13%     | 0.02%    | 0.16%                | 12.42%    |
| Aa            | 2.49%      | 82.84%    | 4.70%    | 2.40%      | 0.09%     | 0.09%    | 1.57%                | 5.81%     |
| A             | 0.74%      | 4.68%     | 79.31%   | 7.74%      | 0.41%     | 0.22%    | 0.52%                | 6.38%     |
| Baa           | 0.40%      | 0.50%     | 4.04%    | 85.07%     | 4.34%     | 1.51%    | 1.72%                | 2.42%     |
| Ba            | 0.00%      | 0.00%     | 0.00%    | 5.71%      | 70.00%    | 7.62%    | 10.00%               | 6.67%     |
| B             | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 93.75%   | 6.25%                | 0.00%     |
| Caa and below | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 0.00%    | 100.00%              | 0.00%     |
| <b>3-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 71.11%     | 1.03%     | 0.34%    | 0.09%      | 0.20%     | 0.16%    | 0.19%                | 26.87%    |
| Aa            | 3.89%      | 68.86%    | 4.79%    | 8.28%      | 1.10%     | 0.10%    | 2.00%                | 10.98%    |
| A             | 2.55%      | 4.86%     | 65.29%   | 9.65%      | 2.35%     | 0.51%    | 1.29%                | 13.49%    |
| Baa           | 2.65%      | 2.19%     | 3.69%    | 66.32%     | 6.11%     | 3.46%    | 6.00%                | 9.57%     |
| Ba            | 0.53%      | 0.00%     | 1.06%    | 4.26%      | 43.09%    | 8.51%    | 27.66%               | 14.89%    |
| B             | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 58.62%   | 37.93%               | 3.45%     |
| Caa and below | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 0.00%    | 100.00%              | 0.00%     |
| <b>4-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 56.91%     | 1.05%     | 0.41%    | 0.15%      | 0.32%     | 0.30%    | 0.35%                | 40.51%    |
| Aa            | 2.56%      | 52.93%    | 5.34%    | 8.22%      | 3.20%     | 0.96%    | 3.52%                | 23.27%    |
| A             | 1.14%      | 4.80%     | 52.76%   | 7.71%      | 4.09%     | 0.76%    | 2.57%                | 26.17%    |
| Baa           | 1.04%      | 1.04%     | 1.82%    | 53.38%     | 7.01%     | 2.60%    | 10.39%               | 22.73%    |
| Ba            | 0.00%      | 0.59%     | 1.18%    | 1.78%      | 27.81%    | 4.73%    | 38.46%               | 25.44%    |
| B             | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 37.50%   | 41.67%               | 20.83%    |
| Caa and below | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 0.00%    | 100.00%              | 0.00%     |
| <b>5-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 45.10%     | 0.70%     | 0.35%    | 0.32%      | 0.35%     | 0.47%    | 0.67%                | 52.03%    |
| Aa            | 3.62%      | 40.82%    | 4.11%    | 10.39%     | 2.05%     | 2.42%    | 5.92%                | 30.68%    |
| A             | 1.22%      | 3.56%     | 43.25%   | 7.16%      | 4.72%     | 0.63%    | 3.41%                | 36.04%    |
| Baa           | 0.90%      | 0.60%     | 0.75%    | 41.41%     | 7.03%     | 2.99%    | 13.45%               | 32.88%    |
| Ba            | 0.00%      | 0.66%     | 0.00%    | 1.32%      | 18.42%    | 3.95%    | 44.74%               | 30.92%    |
| B             | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 28.57%   | 42.86%               | 28.57%    |
| Caa and below | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 0.00%    | 100.00%              | 0.00%     |

## For WR Ratings in the 5-year cohort

## Rating before WR

| <b>Original Rating</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
|------------------------|------------|-----------|----------|------------|-----------|----------|----------------------|-----------|
| Aaa                    | 98.17%     | 1.12%     | 0.22%    | 0.08%      | 0.03%     | 0.00%    | 0.37%                | 0.00%     |
| Aa                     | 8.27%      | 70.47%    | 8.66%    | 8.27%      | 0.00%     | 0.00%    | 4.33%                | 0.00%     |
| A                      | 5.95%      | 11.22%    | 75.14%   | 5.81%      | 0.27%     | 0.27%    | 1.35%                | 0.00%     |
| Baa                    | 11.36%     | 4.55%     | 5.45%    | 71.82%     | 1.36%     | 0.91%    | 4.55%                | 0.00%     |
| Ba                     | 0.00%      | 0.00%     | 2.13%    | 4.26%      | 82.98%    | 2.13%    | 8.51%                | 0.00%     |
| B                      | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 50.00%   | 50.00%               | 0.00%     |
| Caa and below          |            |           |          |            |           |          |                      |           |



| 1-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR    |
|---------------|--------|--------|--------|--------|--------|--------|---------------|-------|
| Aaa           | 97.00% | 0.20%  | 0.02%  | 0.02%  | 0.00%  | 0.00%  | 0.00%         | 2.76% |
| Aa            | 0.05%  | 98.27% | 0.73%  | 0.49%  | 0.12%  | 0.07%  | 0.09%         | 0.19% |
| A             | 0.00%  | 0.04%  | 92.93% | 2.71%  | 2.47%  | 1.39%  | 0.37%         | 0.09% |
| Baa           | 0.00%  | 0.00%  | 0.04%  | 91.48% | 1.99%  | 2.47%  | 3.84%         | 0.19% |
| Ba            | 0.00%  | 0.00%  | 0.00%  | 0.08%  | 83.73% | 3.21%  | 12.61%        | 0.38% |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 98.57% | 0.00%         | 1.43% |
| Caa and below | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 100.00%       | 0.00% |

| 2-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR     |
|---------------|--------|--------|--------|--------|--------|--------|---------------|--------|
| Aaa           | 79.09% | 0.01%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%         | 20.91% |
| Aa            | 0.68%  | 97.43% | 0.29%  | 0.04%  | 0.00%  | 0.00%  | 0.00%         | 1.57%  |
| A             | 0.00%  | 0.39%  | 98.32% | 0.45%  | 0.16%  | 0.06%  | 0.00%         | 0.61%  |
| Baa           | 0.00%  | 0.00%  | 0.08%  | 94.82% | 1.70%  | 0.69%  | 0.48%         | 2.23%  |
| Ba            | 0.00%  | 0.00%  | 0.00%  | 0.14%  | 85.93% | 7.38%  | 4.92%         | 1.64%  |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 94.83% | 3.45%         | 1.72%  |
| Caa and below |        |        |        |        |        |        |               |        |

| 3-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR     |
|---------------|--------|--------|--------|--------|--------|--------|---------------|--------|
| Aaa           | 59.30% | 0.11%  | 0.06%  | 0.00%  | 0.01%  | 0.00%  | 0.00%         | 40.52% |
| Aa            | 3.20%  | 86.93% | 0.78%  | 0.46%  | 0.13%  | 0.07%  | 0.00%         | 8.43%  |
| A             | 0.22%  | 3.01%  | 90.01% | 1.34%  | 0.39%  | 0.06%  | 0.11%         | 4.85%  |
| Baa           | 0.13%  | 0.21%  | 2.54%  | 85.56% | 2.97%  | 1.46%  | 1.12%         | 6.02%  |
| Ba            | 0.00%  | 0.00%  | 0.00%  | 1.44%  | 80.87% | 3.25%  | 7.94%         | 6.50%  |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 70.00% | 16.00%        | 14.00% |
| Caa and below |        |        |        |        |        |        |               |        |

| 4-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR     |
|---------------|--------|--------|--------|--------|--------|--------|---------------|--------|
| Aaa           | 54.30% | 0.25%  | 0.12%  | 0.06%  | 0.01%  | 0.00%  | 0.09%         | 45.18% |
| Aa            | 10.71% | 70.16% | 2.95%  | 0.98%  | 0.33%  | 0.22%  | 0.33%         | 14.32% |
| A             | 0.50%  | 10.50% | 71.30% | 4.70%  | 1.30%  | 0.40%  | 0.50%         | 10.80% |
| Baa           | 0.08%  | 0.54%  | 3.60%  | 59.54% | 8.81%  | 5.75%  | 5.75%         | 15.94% |
| Ba            | 0.00%  | 1.55%  | 0.00%  | 4.65%  | 61.24% | 4.65%  | 10.08%        | 17.83% |
| B             | 0.00%  | 0.00%  | 2.00%  | 0.00%  | 2.00%  | 52.00% | 16.00%        | 28.00% |
| Caa and below |        |        |        |        |        |        |               |        |

| 5-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR     |
|---------------|--------|--------|--------|--------|--------|--------|---------------|--------|
| Aaa           | 47.60% | 0.30%  | 0.10%  | 0.03%  | 0.02%  | 0.00%  | 0.24%         | 51.71% |
| Aa            | 7.48%  | 57.01% | 6.85%  | 2.23%  | 0.32%  | 0.16%  | 0.32%         | 25.64% |
| A             | 1.32%  | 7.62%  | 57.28% | 6.79%  | 3.97%  | 1.49%  | 0.99%         | 20.53% |
| Baa           | 0.14%  | 0.41%  | 2.59%  | 42.10% | 9.26%  | 6.81%  | 12.94%        | 25.75% |
| Ba            | 0.00%  | 0.87%  | 0.00%  | 4.35%  | 52.17% | 4.35%  | 14.78%        | 23.48% |
| B             | 0.00%  | 0.00%  | 2.04%  | 0.00%  | 6.12%  | 42.86% | 6.12%         | 42.86% |
| Caa and below |        |        |        |        |        |        |               |        |

For WR Ratings in the 5-year cohort

Rating before WR

| Original Rating | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR    |
|-----------------|--------|--------|--------|--------|--------|--------|---------------|-------|
| Aaa             | 99.90% | 0.10%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%         | 0.00% |
| Aa              | 19.88% | 75.78% | 0.00%  | 0.00%  | 0.62%  | 0.62%  | 3.11%         | 0.00% |
| A               | 0.81%  | 12.10% | 81.45% | 3.23%  | 0.81%  | 0.00%  | 1.61%         | 0.00% |
| Baa             | 0.53%  | 2.12%  | 5.82%  | 80.42% | 1.06%  | 2.12%  | 7.94%         | 0.00% |
| Ba              | 0.00%  | 3.70%  | 0.00%  | 3.70%  | 62.96% | 11.11% | 18.52%        | 0.00% |
| B               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 14.29% | 85.71%        | 0.00% |
| Caa and below   |        |        |        |        |        |        |               |       |

| 1-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR    |
|---------------|--------|--------|--------|--------|--------|--------|---------------|-------|
| Aaa           | 93.65% | 0.13%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%         | 6.22% |
| Aa            | 1.20%  | 97.25% | 0.66%  | 0.00%  | 0.00%  | 0.00%  | 0.00%         | 0.89% |
| A             | 0.14%  | 0.39%  | 97.85% | 1.20%  | 0.21%  | 0.04%  | 0.00%         | 0.18% |
| Baa           | 0.03%  | 0.00%  | 0.34%  | 97.12% | 1.34%  | 0.58%  | 0.14%         | 0.45% |
| Ba            | 0.00%  | 0.00%  | 0.00%  | 0.82%  | 97.24% | 0.92%  | 0.61%         | 0.41% |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.86%  | 98.72% | 0.21%         | 0.21% |
| Caa and below | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 100.00%       | 0.00% |

| 2-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR     |
|---------------|--------|--------|--------|--------|--------|--------|---------------|--------|
| Aaa           | 82.39% | 0.23%  | 0.01%  | 0.00%  | 0.00%  | 0.00%  | 0.00%         | 17.38% |
| Aa            | 5.75%  | 89.32% | 1.57%  | 0.04%  | 0.00%  | 0.00%  | 0.00%         | 3.32%  |
| A             | 0.62%  | 5.46%  | 90.43% | 1.72%  | 0.16%  | 0.05%  | 0.00%         | 1.56%  |
| Baa           | 0.20%  | 0.24%  | 4.55%  | 89.91% | 1.47%  | 0.88%  | 0.64%         | 2.11%  |
| Ba            | 0.00%  | 0.38%  | 0.38%  | 6.75%  | 88.66% | 0.89%  | 0.89%         | 2.04%  |
| B             | 0.00%  | 0.00%  | 0.23%  | 0.46%  | 7.34%  | 90.14% | 0.23%         | 1.61%  |
| Caa and below | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 100.00%       | 0.00%  |

| 3-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR     |
|---------------|--------|--------|--------|--------|--------|--------|---------------|--------|
| Aaa           | 67.81% | 0.31%  | 0.02%  | 0.01%  | 0.00%  | 0.00%  | 0.00%         | 31.85% |
| Aa            | 14.35% | 70.51% | 2.65%  | 0.18%  | 0.13%  | 0.00%  | 0.00%         | 12.18% |
| A             | 4.21%  | 12.16% | 72.81% | 1.43%  | 0.16%  | 0.00%  | 0.24%         | 8.98%  |
| Baa           | 0.54%  | 2.33%  | 11.65% | 73.37% | 1.01%  | 0.62%  | 0.08%         | 10.40% |
| Ba            | 0.00%  | 0.50%  | 4.50%  | 14.33% | 71.00% | 0.83%  | 1.33%         | 7.50%  |
| B             | 0.00%  | 0.00%  | 0.56%  | 0.28%  | 15.17% | 72.19% | 2.25%         | 9.55%  |
| Caa and below | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 100.00%       | 0.00%  |

| 4-year        | Aaa    | Aa     | A      | Baa    | Ba      | B      | Caa and below | WR     |
|---------------|--------|--------|--------|--------|---------|--------|---------------|--------|
| Aaa           | 55.92% | 0.37%  | 0.05%  | 0.01%  | 0.01%   | 0.00%  | 0.00%         | 43.64% |
| Aa            | 20.79% | 54.74% | 3.14%  | 0.65%  | 0.24%   | 0.09%  | 0.00%         | 20.35% |
| A             | 9.25%  | 17.52% | 51.03% | 2.18%  | 1.09%   | 0.11%  | 0.44%         | 18.39% |
| Baa           | 1.69%  | 4.65%  | 15.12% | 55.60% | 1.16%   | 0.74%  | 1.59%         | 19.45% |
| Ba            | 0.42%  | 0.42%  | 7.37%  | 16.63% | 57.89%  | 1.05%  | 1.89%         | 14.32% |
| B             | 0.00%  | 0.36%  | 0.36%  | 0.72%  | 17.33%  | 60.29% | 2.53%         | 18.41% |
| Caa and below | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 100.00% | 0.00%  | 0.00%         | 0.00%  |

| 5-year        | Aaa    | Aa     | A      | Baa    | Ba      | B      | Caa and below | WR     |
|---------------|--------|--------|--------|--------|---------|--------|---------------|--------|
| Aaa           | 43.42% | 0.30%  | 0.07%  | 0.02%  | 0.01%   | 0.01%  | 0.00%         | 56.17% |
| Aa            | 23.97% | 42.67% | 3.67%  | 0.73%  | 0.41%   | 0.26%  | 0.19%         | 28.09% |
| A             | 10.12% | 14.70% | 44.24% | 2.50%  | 1.11%   | 0.14%  | 1.66%         | 25.52% |
| Baa           | 2.79%  | 4.91%  | 11.67% | 49.20% | 1.86%   | 0.66%  | 3.05%         | 25.86% |
| Ba            | 0.27%  | 0.53%  | 8.78%  | 14.89% | 54.26%  | 1.06%  | 1.86%         | 18.35% |
| B             | 0.00%  | 0.00%  | 0.00%  | 1.50%  | 14.00%  | 54.50% | 4.00%         | 26.00% |
| Caa and below | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 100.00% | 0.00%  | 0.00%         | 0.00%  |

For WR Ratings in the 5-year cohort

Rating before WR

| Original Rating | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR    |
|-----------------|--------|--------|--------|--------|--------|--------|---------------|-------|
| Aaa             | 99.27% | 0.69%  | 0.03%  | 0.00%  | 0.00%  | 0.00%  | 0.00%         | 0.00% |
| Aa              | 25.80% | 71.36% | 2.50%  | 0.23%  | 0.00%  | 0.00%  | 0.11%         | 0.00% |
| A               | 15.22% | 27.72% | 55.98% | 1.09%  | 0.00%  | 0.00%  | 0.00%         | 0.00% |
| Baa             | 3.08%  | 13.33% | 21.54% | 60.00% | 1.03%  | 1.03%  | 0.00%         | 0.00% |
| Ba              | 0.00%  | 0.00%  | 26.09% | 21.74% | 42.03% | 0.00%  | 10.14%        | 0.00% |
| B               | 0.00%  | 0.00%  | 0.00%  | 5.77%  | 42.31% | 44.23% | 7.69%         | 0.00% |
| Caa and below   |        |        |        |        |        |        |               |       |

| 1-year        | Aaa           | Aa            | A             | Baa           | Ba            | B             | Caa and below | WR     |
|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|--------|
| Aaa           | <b>98.54%</b> | 0.30%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 1.15%  |
| Aa            | 1.95%         | <b>96.80%</b> | 0.31%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.94%  |
| A             | 0.07%         | 0.88%         | <b>96.85%</b> | 1.25%         | 0.37%         | 0.00%         | 0.00%         | 0.59%  |
| Baa           | 0.00%         | 0.05%         | 0.42%         | <b>96.55%</b> | 0.90%         | 0.14%         | 0.00%         | 1.94%  |
| Ba            | 0.00%         | 0.00%         | 0.00%         | 0.26%         | <b>99.04%</b> | 0.17%         | 0.00%         | 0.52%  |
| B             | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.11%         | <b>99.45%</b> | 0.22%         | 0.22%  |
| Caa and below | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | <b>96.97%</b> | 3.03%  |
| 2-year        | Aaa           | Aa            | A             | Baa           | Ba            | B             | Caa and below | WR     |
| Aaa           | <b>90.51%</b> | 0.74%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 8.75%  |
| Aa            | 8.70%         | <b>81.72%</b> | 0.89%         | 0.00%         | 0.00%         | 0.30%         | 0.00%         | 8.40%  |
| A             | 1.90%         | 5.03%         | <b>84.14%</b> | 1.04%         | 1.04%         | 0.09%         | 0.00%         | 6.74%  |
| Baa           | 0.36%         | 0.48%         | 2.96%         | <b>80.42%</b> | 2.18%         | 0.30%         | 0.06%         | 13.23% |
| Ba            | 0.00%         | 0.00%         | 0.11%         | 1.58%         | <b>93.02%</b> | 1.13%         | 0.00%         | 4.17%  |
| B             | 0.14%         | 0.00%         | 0.00%         | 0.14%         | 0.55%         | <b>96.01%</b> | 1.38%         | 1.79%  |
| Caa and below | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | <b>93.75%</b> | 6.25%  |
| 3-year        | Aaa           | Aa            | A             | Baa           | Ba            | B             | Caa and below | WR     |
| Aaa           | <b>81.86%</b> | 1.03%         | 0.10%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 17.02% |
| Aa            | 11.75%        | <b>66.79%</b> | 1.44%         | 1.20%         | 0.00%         | 0.00%         | 0.00%         | 18.82% |
| A             | 3.40%         | 6.34%         | <b>72.59%</b> | 1.47%         | 2.15%         | 0.23%         | 0.00%         | 13.82% |
| Baa           | 0.80%         | 1.23%         | 4.14%         | <b>64.71%</b> | 2.61%         | 1.16%         | 0.15%         | 25.20% |
| Ba            | 0.00%         | 0.14%         | 1.00%         | 2.00%         | <b>88.57%</b> | 3.00%         | 0.14%         | 5.14%  |
| B             | 0.17%         | 0.17%         | 0.17%         | 0.34%         | 0.84%         | <b>90.71%</b> | 3.89%         | 3.72%  |
| Caa and below | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 3.13%         | 0.00%         | <b>87.50%</b> | 9.38%  |
| 4-year        | Aaa           | Aa            | A             | Baa           | Ba            | B             | Caa and below | WR     |
| Aaa           | <b>76.75%</b> | 0.72%         | 0.07%         | 0.00%         | 0.00%         | 0.07%         | 0.00%         | 22.40% |
| Aa            | 22.55%        | <b>47.92%</b> | 1.19%         | 0.59%         | 0.89%         | 0.00%         | 0.30%         | 26.56% |
| A             | 3.94%         | 14.51%        | <b>55.63%</b> | 2.54%         | 1.97%         | 0.14%         | 0.00%         | 21.27% |
| Baa           | 1.68%         | 1.50%         | 8.29%         | <b>49.82%</b> | 3.00%         | 0.44%         | 0.18%         | 35.10% |
| Ba            | 0.19%         | 0.38%         | 0.38%         | 4.72%         | <b>78.49%</b> | 6.04%         | 1.13%         | 8.68%  |
| B             | 0.00%         | 0.00%         | 0.00%         | 0.22%         | 1.51%         | <b>76.89%</b> | 12.96%        | 8.42%  |
| Caa and below | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | <b>84.38%</b> | 15.63% |
| 5-year        | Aaa           | Aa            | A             | Baa           | Ba            | B             | Caa and below | WR     |
| Aaa           | <b>70.66%</b> | 0.74%         | 0.17%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 28.43% |
| Aa            | 24.82%        | <b>40.54%</b> | 1.43%         | 0.36%         | 1.07%         | 0.00%         | 0.71%         | 31.07% |
| A             | 8.30%         | 15.19%        | <b>46.82%</b> | 2.65%         | 1.77%         | 0.71%         | 0.00%         | 24.56% |
| Baa           | 1.87%         | 2.53%         | 8.81%         | <b>43.61%</b> | 2.64%         | 0.33%         | 0.44%         | 39.76% |
| Ba            | 0.00%         | 0.72%         | 0.72%         | 5.31%         | <b>68.84%</b> | 7.73%         | 2.90%         | 13.77% |
| B             | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 1.90%         | <b>66.94%</b> | 18.97%        | 12.20% |
| Caa and below | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 3.45%         | <b>82.76%</b> | 13.79% |

For WR Ratings in the 5-year cohort

Rating before WR

| Original Rating | Aaa           | Aa            | A             | Baa           | Ba            | B             | Caa and below | WR    |
|-----------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|-------|
| Aaa             | <b>95.93%</b> | 3.20%         | 0.58%         | 0.00%         | 0.00%         | 0.29%         | 0.00%         | 0.00% |
| Aa              | 39.66%        | <b>55.17%</b> | 1.15%         | 1.72%         | 0.00%         | 1.72%         | 0.57%         | 0.00% |
| A               | 19.42%        | 19.42%        | <b>48.20%</b> | 3.60%         | 8.63%         | 0.00%         | 0.72%         | 0.00% |
| Baa             | 5.54%         | 4.71%         | 8.31%         | <b>64.27%</b> | 11.91%        | 3.60%         | 1.66%         | 0.00% |
| Ba              | 3.51%         | 5.26%         | 10.53%        | 15.79%        | <b>47.37%</b> | 14.04%        | 3.51%         | 0.00% |
| B               | 4.44%         | 0.00%         | 2.22%         | 13.33%        | 17.78%        | <b>40.00%</b> | 22.22%        | 0.00% |
| Caa and below   | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 25.00%        | 0.00%         | <b>75.00%</b> | 0.00% |

| 1-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR     |
|---------------|--------|--------|--------|--------|--------|--------|---------------|--------|
| Aaa           | 97.17% | 0.48%  | 0.45%  | 0.30%  | 0.24%  | 0.18%  | 0.21%         | 0.98%  |
| Aa            | 0.06%  | 94.67% | 1.20%  | 0.92%  | 0.63%  | 0.40%  | 0.92%         | 1.20%  |
| A             | 0.00%  | 0.00%  | 93.20% | 2.32%  | 1.70%  | 0.40%  | 1.93%         | 0.45%  |
| Baa           | 0.05%  | 0.00%  | 0.10%  | 93.31% | 2.13%  | 0.97%  | 2.81%         | 0.63%  |
| Ba            | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 94.15% | 1.36%  | 3.55%         | 0.94%  |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 91.49% | 3.19%         | 5.32%  |
| Caa and below | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 50.00%        | 50.00% |

| 2-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR     |
|---------------|--------|--------|--------|--------|--------|--------|---------------|--------|
| Aaa           | 96.54% | 0.57%  | 0.18%  | 0.13%  | 0.00%  | 0.00%  | 0.00%         | 2.59%  |
| Aa            | 0.28%  | 93.59% | 1.67%  | 0.56%  | 0.19%  | 0.09%  | 0.00%         | 3.62%  |
| A             | 0.00%  | 0.34%  | 94.76% | 2.15%  | 0.52%  | 0.26%  | 0.09%         | 1.89%  |
| Baa           | 0.07%  | 0.20%  | 0.26%  | 92.73% | 2.97%  | 0.73%  | 1.32%         | 1.72%  |
| Ba            | 0.00%  | 0.00%  | 0.00%  | 0.29%  | 93.07% | 1.77%  | 2.21%         | 2.65%  |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 84.09% | 7.95%         | 7.95%  |
| Caa and below | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 50.00%        | 50.00% |

| 3-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR     |
|---------------|--------|--------|--------|--------|--------|--------|---------------|--------|
| Aaa           | 90.12% | 2.44%  | 0.31%  | 0.44%  | 0.06%  | 0.00%  | 0.00%         | 6.63%  |
| Aa            | 1.42%  | 80.62% | 6.20%  | 3.10%  | 0.90%  | 0.26%  | 0.00%         | 7.49%  |
| A             | 0.59%  | 1.19%  | 85.37% | 3.33%  | 2.02%  | 0.95%  | 0.48%         | 6.06%  |
| Baa           | 0.09%  | 0.60%  | 0.52%  | 78.95% | 5.35%  | 3.97%  | 5.95%         | 4.57%  |
| Ba            | 0.00%  | 0.00%  | 0.00%  | 1.10%  | 75.82% | 6.41%  | 12.09%        | 4.58%  |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 59.04% | 28.92%        | 12.05% |
| Caa and below | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 50.00%        | 50.00% |

| 4-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR      |
|---------------|--------|--------|--------|--------|--------|--------|---------------|---------|
| Aaa           | 76.13% | 4.86%  | 2.60%  | 0.67%  | 0.34%  | 0.17%  | 0.00%         | 15.24%  |
| Aa            | 1.82%  | 64.68% | 8.29%  | 6.63%  | 2.82%  | 1.66%  | 1.00%         | 13.10%  |
| A             | 0.33%  | 1.63%  | 64.33% | 4.89%  | 3.75%  | 1.47%  | 3.42%         | 20.20%  |
| Baa           | 0.11%  | 0.44%  | 1.33%  | 56.02% | 5.97%  | 6.30%  | 15.80%        | 14.03%  |
| Ba            | 0.00%  | 0.00%  | 0.00%  | 0.85%  | 57.05% | 5.77%  | 22.22%        | 14.10%  |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 44.87% | 41.03%        | 14.10%  |
| Caa and below | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%         | 100.00% |

| 5-year        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR      |
|---------------|--------|--------|--------|--------|--------|--------|---------------|---------|
| Aaa           | 61.52% | 4.70%  | 3.02%  | 1.57%  | 0.78%  | 0.45%  | 0.00%         | 27.96%  |
| Aa            | 1.07%  | 48.93% | 8.97%  | 8.12%  | 4.27%  | 2.35%  | 2.99%         | 23.29%  |
| A             | 0.00%  | 2.20%  | 48.68% | 4.85%  | 3.08%  | 2.20%  | 4.85%         | 34.14%  |
| Baa           | 0.13%  | 0.00%  | 0.00%  | 39.03% | 8.48%  | 7.13%  | 21.94%        | 23.28%  |
| Ba            | 0.00%  | 0.00%  | 0.00%  | 1.23%  | 43.49% | 5.16%  | 24.57%        | 25.55%  |
| B             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 35.53% | 50.00%        | 14.47%  |
| Caa and below | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%         | 100.00% |

For WR Ratings in the 5-year cohort

| Rating before WR |        |        |        |        |        |        |               |       |
|------------------|--------|--------|--------|--------|--------|--------|---------------|-------|
| Original Rating  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below | WR    |
| Aaa              | 93.60% | 4.00%  | 2.00%  | 0.40%  | 0.00%  | 0.00%  | 0.00%         | 0.00% |
| Aa               | 1.83%  | 86.24% | 6.42%  | 2.75%  | 1.83%  | 0.00%  | 0.92%         | 0.00% |
| A                | 1.29%  | 5.81%  | 83.87% | 3.87%  | 4.52%  | 0.00%  | 0.65%         | 0.00% |
| Baa              | 1.16%  | 1.16%  | 4.05%  | 78.61% | 6.36%  | 2.89%  | 5.78%         | 0.00% |
| Ba               | 0.00%  | 0.00%  | 0.00%  | 3.85%  | 76.92% | 6.73%  | 12.50%        | 0.00% |
| B                | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 81.82% | 18.18%        | 0.00% |
| Caa and below    | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 100.00%       | 0.00% |

## Related Research

### Special Comments:

- Structured Finance Rating Transitions: 1983-2006, January 2007 (101833)
- European Structured Finance Rating Transitions: 1988-2006, February 2007 (102033)
- Japanese Structured Finance Rating Transitions: 1994-2006, March 2007 (102509)
- Asia Pacific (ex-Japan) Structured Finance Rating Transitions: 1990-2006 (102095)
- Default & Loss Rates of Structured Finance Securities: 1993-2006, April 2007 (102733)
- Measuring Loss-Given-Default for Structured Finance Securities: An Update, December 2006 (101284)
- The Performance of Structured Finance Ratings: Mid-Year 2007 Report, October 2007 (105390)
- Guide to Moody's Default Research: November 2007 Update, December 2007 (106428)

### Special Reports:

- Rating Changes in the U.S. Asset-Backed Securities Market: 2007 Fourth Quarter Update, February 1, 2008 (SF121161)
- Rating Changes in the U.S. Residential Mortgage-Backed Securities Market: 2007 Second Half Update, February 1, 2008 (SF122208)
- U.S. Subprime RMBS 2005-2007 Vintage Rating Actions Update: January 2008, February 1, 2008 (SF121189)
- U.S. Alt-A RMBS 2005-2007 Vintage Rating Actions Update: January 2008, February 1, 2008 (SF122643)
- Structured Finance CDO Ratings Surveillance Brief December 2007, January 17, 2008 (SF120504)

Report Number: 107444

**Author**  
Julia Tung

**Production Specialist**  
Ida Chan



**Moody's Investors Service**

March 2009

## Structured Finance Rating Transitions: 1983-2008

This is Moody's seventh annual global structured finance rating transitions study. We review the 2008 and historical transition rates both on an aggregate basis and within key asset classes and provide comparisons to the corporate rating transition experience.

### Key Findings

The 12-month downgrade rate for the global structured finance market climbed to a historical high of 35.5% in 2008 from 7.4% in 2007, while the upgrade rate decreased from 2.2% to 0.7%. Overall, 37,213 ratings from 6,263 deals were downgraded and 724 ratings from 284 deals were upgraded.

The average number of notches lowered over the year per downgraded security also increased from 5.8 notches in 2007 to 8.3 notches in 2008; meanwhile, the average magnitude of upgrades fell from 2.3 notches to 2.1 notches.

Aaa downgrades and transitions to Caa and below increased from the previous year and reached peak highs in 2008.

The large numbers of downgrades in 2008 were primarily driven by the poor performance of recent vintage US mortgage-backed securities backed by subprime, Alt-A and Jumbo loans, structured finance CDOs with exposures to these securities and downgrades of the financial guarantors. The 12-month downgrade rate for US HEL (including subprime securities), US RMBS (including Alt-A and Jumbo securities), and US CDOs in 2008 rose to 54.3%, 37.3%, and 48.3%, respectively. However, if we exclude these poor performing asset classes and vintages, the global downgrade rate drops from 35.5% to 12.1%. Even the average size of the downgrade drops from 8.3 notches to 5.2 notches.

Even though all structured finance sectors were exposed to negative headline risk, US CMBS performed better than the overall structured finance market in 2008 accounting for 63.8% of all upgrades and producing an upgrade-to downgrade ratio of nearly 1 to 1.

### Table of Contents:

|  |    |
|--|----|
| Key Findings   | 1  |
| An Overview of Rating Transitions in 2008                                  | 3  |
| Sector Specific Analysis of Rating Transitions                             | 14 |
| Regional Comparisons of Rating Transitions                                 | 35 |
| Rating Transitions Among Global Repackaged Securities and Structured Notes | 42 |
| Appendix I: Description of Data Sample and Glossary                        | 44 |
| Glossary   | 45 |
| Appendix II: Methodology   | 48 |
| Appendix III: Multi-Year Horizon Transition Matrices                       | 50 |
| Moody's Related Research   | 84 |

### Analyst Contacts:

**New York**                    **1.212.553.1653**

**Debjani Dutta Roy**  
*Associate Analyst*

**Julia Tung**  
*Vice President – Senior Credit Officer*

**Albert Metz**  
*Senior Vice President*

**Nicolas Weill**  
*Group Managing Director*

**Richard Cantor**  
*Chief Risk Officer*

**London**                    **44.20.7772.5454**

**David Rosa**  
*Senior Vice President*



**Exhibit 1 Global Structured Finance 12-Month Downgrade and Upgrade Rates by Sector in 2008, 2007, and Averaged over 1999-2008**

|  | 12-month Downgrade Rate |       |           | 12-month Upgrade Rate |       |           |
|--|-------------------------|-------|-----------|-----------------------|-------|-----------|
|  | 2008                    | 2007  | 1999-2008 | 2008                  | 2007  | 1999-2008 |
| US ABS ex HEL  | 16.1%                   | 0.4%  | 5.5%      | 0.3%                  | 2.5%  | 1.5%      |
| US Autos   | 20.5%                   | 0.0%  | 1.4%      | 1.3%                  | 9.2%  | 5.1%      |
| US Credit Cards  | 4.5%                    | 0.0%  | 0.9%      | 0.0%                  | 7.5%  | 2.0%      |
| US Student Loans   | 23.9%                   | 0.1%  | 2.0%      | 0.0%                  | 0.7%  | 0.8%      |
| US Equipment Lease   | 5.6%                    | 1.7%  | 4.8%      | 5.2%                  | 4.2%  | 2.3%      |
| US HEL (includes subprime)                                   | 54.3%                   | 18.5% | 13.8%     | 0.1%                  | 1.0%  | 0.9%      |
| excl '05-'07 vintages  | 23.5%                   | 9.4%  | 4.3%      | 0.2%                  | 2.1%  | 1.2%      |
| US RMBS (includes Alt-A, Jumbo)                              | 37.3%                   | 4.5%  | 5.0%      | 0.0%                  | 0.7%  | 1.6%      |
| excl '05-'07 vintages  | 6.6%                    | 0.6%  | 0.4%      | 0.1%                  | 1.7%  | 2.2%      |
| US CMBS  | 4.3%                    | 0.8%  | 2.6%      | 4.7%                  | 10.2% | 9.2%      |
| US CDOs  | 48.3%                   | 8.3%  | 13.9%     | 0.6%                  | 1.3%  | 1.3%      |
| excl US SF CDOs  | 18.1%                   | 1.1%  | 6.7%      | 1.1%                  | 1.3%  | 1.4%      |
| US HY CBOs   | 5.9%                    | 2.8%  | 14.9%     | 1.5%                  | 4.3%  | 3.0%      |
| US HY CLOs   | 2.5%                    | 0.2%  | 1.3%      | 1.7%                  | 0.6%  | 1.0%      |
| US SF CDOs   | 90.8%                   | 20.0% | 32.0%     | 0.0%                  | 1.3%  | 1.0%      |
| US Synthetic Arbitrage CDOs                                  | 59.7%                   | 0.9%  | 12.0%     | 0.0%                  | 0.4%  | 0.3%      |
| US Structured Finance  | 38.0%                   | 8.1%  | 7.8%      | 0.6%                  | 2.0%  | 2.2%      |
| EMEA Structured Finance                                      | 19.1%                   | 2.7%  | 4.5%      | 0.9%                  | 3.0%  | 2.8%      |
| Asia Pacific Structured Finance                              | 7.7%                    | 0.9%  | 1.3%      | 2.6%                  | 4.6%  | 4.1%      |
| Latin America Structured Finance                             | 17.8%                   | 1.0%  | 7.8%      | 3.5%                  | 13.3% | 7.2%      |
| Global Structured Finance                                    | 35.5%                   | 7.4%  | 7.4%      | 0.7%                  | 2.2%  | 2.3%      |
| excl SF CDOs, Other SF, and '05-'07<br>vintage US HEL & RMBS | 12.1%                   | 2.3%  | 3.2%      | 1.3%                  | 3.6%  | 2.8%      |
| Global Corporate   | 18.2%                   | 8.8%  | 13.2%     | 4.6%                  | 18.7% | 11.2%     |

Even though no region was spared from a sharp increase in the 12-month downgrade rate for the cohort ending 12/31/2008, the Asia-Pacific Structured market experienced the smallest increase. It also experienced the lowest rate and the smallest average downgrade size. The EMEA region was exposed to similar macro factors as was the US such as flat or declining home prices, corporate failures and increased refinancing risk. Latin America saw the bulk of its downgrades result from financial guarantor related downgrades.



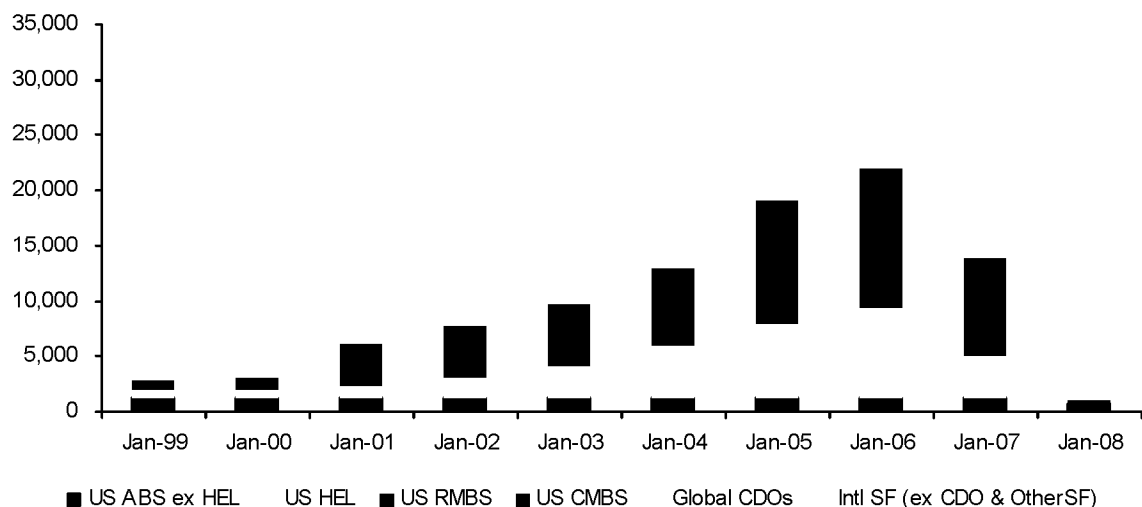
## An Overview of Rating Transitions in 2008

2008 marked the most tumultuous year experienced to date by the global structured finance market. The tip of the iceberg revealed itself in the second half of 2007 when house price declines in the US resulted in poor performance of recent vintage securities backed by subprime and Alt-A mortgages leading to series of downgrades. This in turn caused multiple negative rating actions to be taken against recently securitized CDOs with exposures to these downgraded mortgage-backed securities. The subsequent decline in the market value of structured finance securities and stressful conditions in the market in general had a devastating effect on transactions exposed to liquidity and market price volatility, such as structured investment vehicles and market-value CDOs. The size and scope of these cascading events eventually lead to bank failures and insurer downgrades across the globe as a result of leverage, margin calls, bleeding portfolios with limited refinancing opportunities and rising unemployment. As a result of these unprecedented market conditions, the 12-month downgrade rate increased to a historical high in 2008 and there was no sector or region that was immune from the deteriorating performance from 2007.

In this section we discuss rating transitions for the global structured finance market, excluding derivative securities such as structured notes and repackaged securities. Detailed rating transitions data for the major sectors in the US (ABS excluding HEL, HEL, RMBS, CMBS, and CDOs) and the other structured finance category are presented later in the report. Rating transitions in EMEA (Europe, the Middle East, and Africa), the Asia-Pacific region and Latin America, as well as the global derivatives sector, are also analyzed later in the report.<sup>1</sup> Multi-year horizon transition matrices can be found in the Appendix. Note that the criteria used to create the data set are the same as those used in last year's report. Pari-passu tranches remain uncollapsed and wrapped tranches are included. In addition, the rating immediately prior to withdrawal is now used to count downgrades and upgrades. For a more detailed description of the data sample and calculation methods, please see the Appendix.

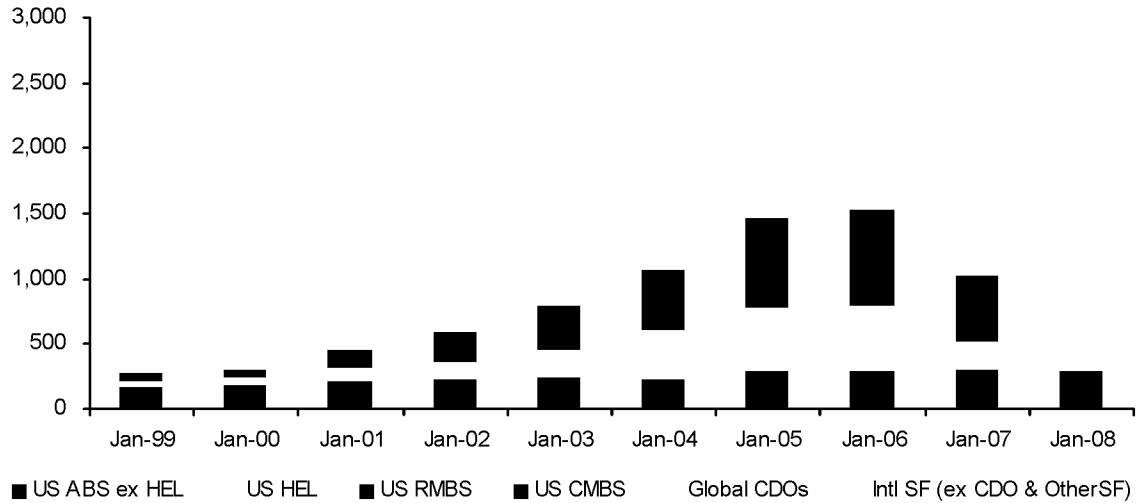
In 2008, structured finance issuance was down sharply, 50% on a dollar volume basis and 87% by count from 2007 levels (Exhibit 2). The severe contraction was seen in all sectors from US mortgage-backed securities to Global CDOs. US HEL issuance (including subprime securities) dropped roughly 99.5% by volume and count, US RMBS issuance (including Alt-A securities) decreased about 92% by volume and 96% by count, US CMBS dropped roughly 90% by volume and count and CDOs, globally, fell approximately 80% by volume and 90% by count. While the US ABS (excluding HEL) and international structured finance market were down 50% by count, on a volume basis they were down moderately (20% and 2% respectively) (Exhibit 2).

**Exhibit 2A: Structured Finance Issuance by Rating Count per Year**



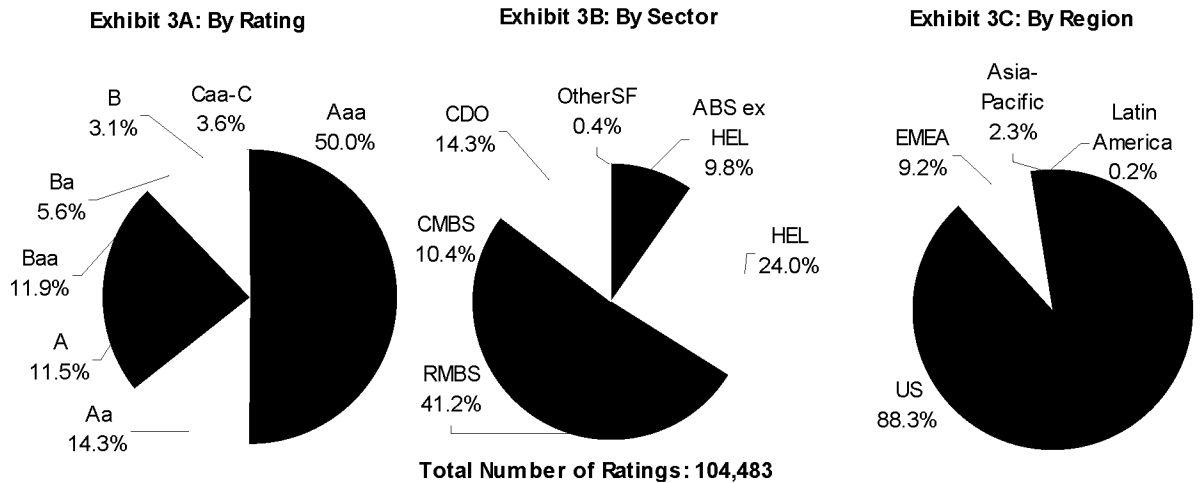
<sup>1</sup> Moody's also publishes separate rating transition studies for EMEA, Japan, and the Asia Pacific region ex-Japan (forthcoming).

**Exhibit 2B: Structured Finance Issuance Volume (US\$ billions) per Year**



At the beginning of 2008, there were 104,483 global structured finance ratings outstanding from 14,792 deals. More than half the securities outstanding at the beginning of the year were Aaa-rated, with the rest of the investment-grade rating categories taking roughly equal shares of around 11.5%-14% each (Exhibit 3A). By sector, RMBS was the biggest share (41.2%), followed by HEL (24%), CDOs (14.3%), ABS excluding HEL (9.8%), CMBS (10.4%), and the other structured finance category (0.4%) (Exhibit 3B). Structured finance ratings were still heavily concentrated in the US,<sup>2</sup> which accounted for 88.3% of outstanding ratings (Exhibit 3C).

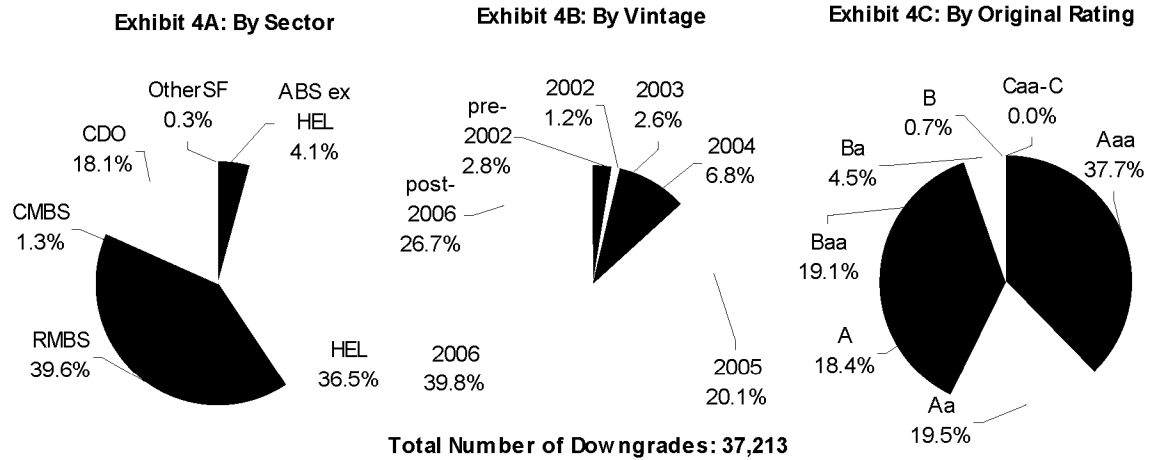
**Exhibit 3: Distribution of Outstanding Ratings on 1/1/2008**



Over the course of 2008, 37,213 ratings from 6,263 deals were downgraded and 724 ratings from 284 deals were upgraded in the global structured finance market. Like 2007, downgrades were heavily skewed to a few specific sectors, vintages, and rating categories. 94% of the downgrades occurred in RMBS (39.6%), HEL (36.5%) and CDO (18%) sectors (Exhibit 4A). Securities issued post -2004 accounted for almost 86.6% of downgrade activity (Exhibit 4B), while close to 95% of the downgrades occurred in the originally investment grade rated category (Exhibit 4C). As discussed later, the bulk of the downgrades in 2008 involved poorly performing subprime, Alt-A, and SF CDO securities from the 2005H2, 2006 and 2007 vintages.

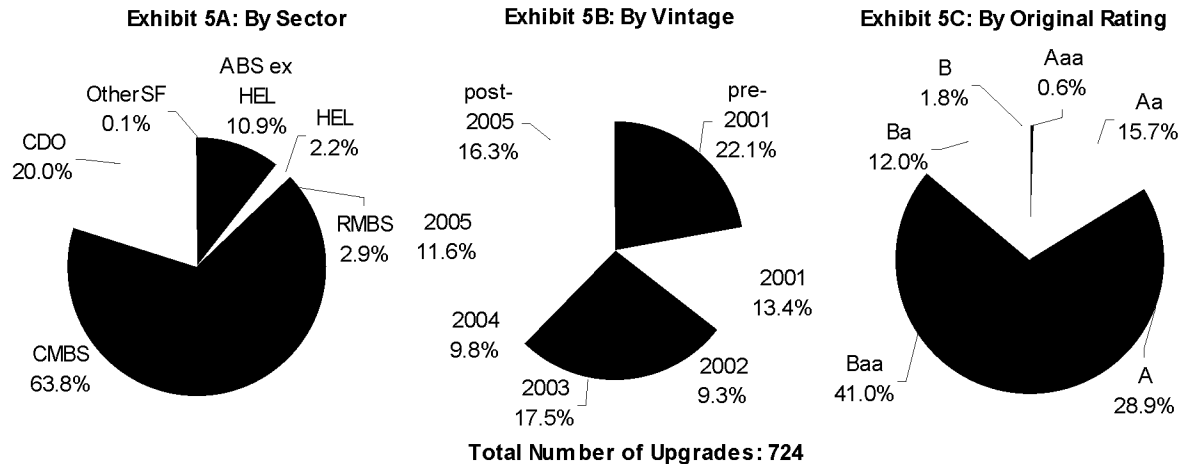
<sup>2</sup> Canadian structured finance securities are included in the US total. There were 382 Canadian structured finance ratings outstanding as of 1/1/2008, representing only 0.41% of the US total.

**Exhibit 4: Distribution of Downgrades in 2008**



As in 2005, 2006 and 2007, upgrades for the year were concentrated in the CMBS sector, the source of 63.8% of all upgrade activity in 2008 (Exhibit 5A). Unlike downgrades during the year, upgrades were more uniformly distributed by vintage (Exhibit 5B). Securities originally rated Baa and single-A were upgraded the most, but Aa-rated securities also accounted for a significant share of upgrade activity (Exhibit 5C). Upgrades were mostly caused by increased credit enhancement and/or strong collateral performance.

**Exhibit 5: Distribution of Upgrades in 2008**



**Analysis of Rating Transition Trends**

The 12-month downgrade rate climbed from 7.4% to a historical high of 35.5% in 2008, while the 12-month upgrade rate declined from 2.2% to 0.6% (Exhibits 6A and 6E). The average magnitude of rating downgrades, measured as the average number of notches changed in the course of a 12-month period per downgraded security, also saw an increase to 8.3 notches from 5.8 in 2007 and 2.9 in 2006 (Exhibit 6B). Meanwhile, the average magnitude of upgrades stayed relatively flat in 2008 at 2.1 notches from 2.3 in 2007.

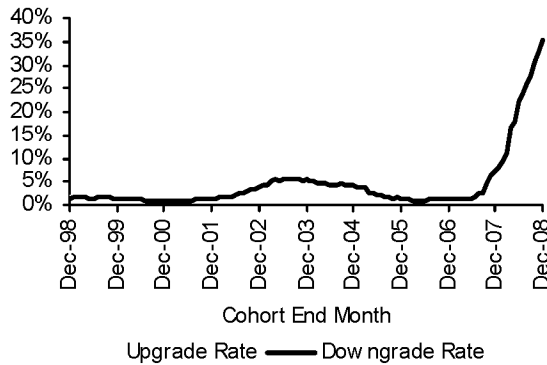
Both the fallen angel rate, defined as the rate at which investment-grade securities are downgraded to non-investment grade, and the Aaa downgrade rate increased to 19.2% and 26.1% respectively in 2008, mimicking the overall 12-month downgrade rate (Exhibit 6C).

Exhibit 6D shows the cumulative transition rates of securities issued between 1983 and 2008. It compares the original rating of the tranche to its rating as of 12/31/08 (or to its last rating prior to withdrawal). Despite the downgrades of 2008, Aaa ratings, which comprise of approximately 50% of the entire structured finance market, were relatively more stable than the other broad rating categories, having experienced a 16.6%

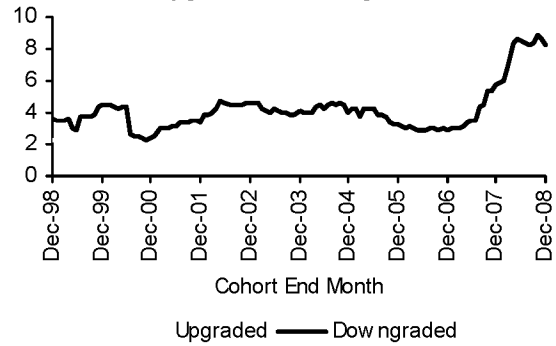
downgrade rate. The other broad rating categories have been less stable with more than half having lost their original ratings to a downgrade or upgrade event. The double-A and single-B rating categories experienced a 2.5 cumulative downgrade to upgrade ratio, the single-A rating category experienced a 3.2 cumulative downgrade to upgrade ratio and, the Baa and Ba broad rating categories experienced a 4.5 cumulative downgrade to upgrade ratio.

**Exhibit 6A: Global Structured Finance Rating Transition Trends**

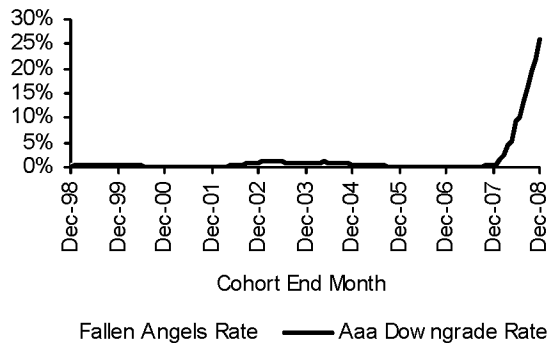
**Exhibit 6A: Upgrade and Downgrade Rates**



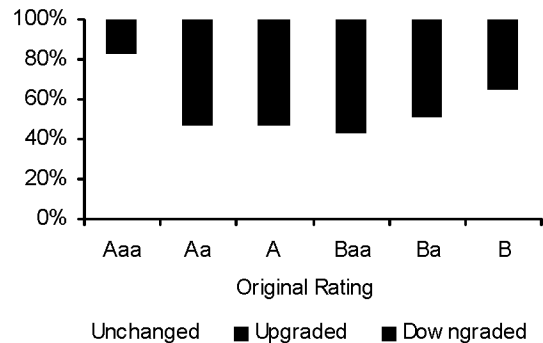
**Exhibit 6B: Average Number of Notches Upgraded or Downgraded**



**Exhibit 6C: Fallen Angel Rates and Aaa Downgrade Rates**



**Exhibit 6D: Cumulative Upgrade and Downgrade Rates by Original Rating**



**Exhibit 6E: Summary of Rating Transition Trends**

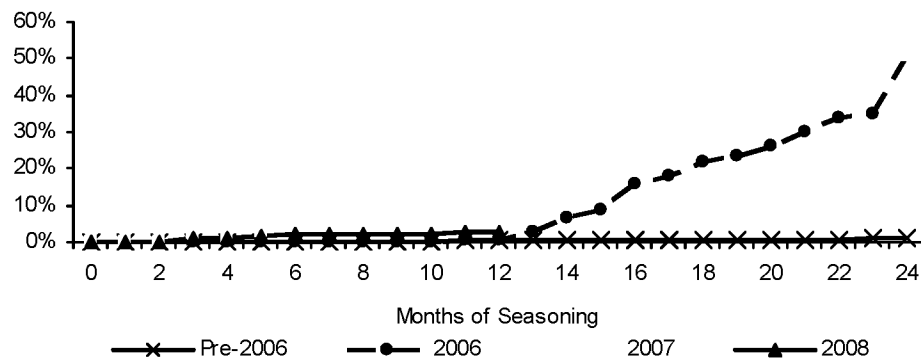
|  | 2008     | 2007    | 1999-2008 | 1999-2007 |
|--|----------|---------|-----------|-----------|
| Downgrade Rate                           | 35.50%   | 7.41%   | 7.38%     | 2.63%     |
| Upgrade Rate                             | 0.69%    | 2.21%   | 2.30%     | 2.62%     |
| Downgrade/Upgrade Ratio                  | 51.59    | 3.35    | 3.21      | 1.00      |
| Downgrade Rate (Notch Weighted)          | 294.64%  | 42.69%  | 52.98%    | 11.08%    |
| Upgrade Rate (Notch Weighted)            | 1.46%    | 5.04%   | 5.68%     | 6.59%     |
| Downgrade/Upgrade Ratio (Notch Weighted) | 202.26   | 8.47    | 9.32      | 1.68      |
| Rating Drift (Notch Weighted)            | -293.18% | -37.65% | -47.30%   | -4.49%    |
| Rating Volatility (Notch Weighted)       | 296.09%  | 47.72%  | 58.67%    | 17.66%    |
| Stability Rate                           | 63.81%   | 90.37%  | 90.32%    | 94.75%    |
| Average Number of Notches Downgraded     | 8.30     | 5.76    | 7.18      | 4.22      |
| Average Number of Notches Upgraded       | 2.12     | 2.28    | 2.48      | 2.51      |

Securities issued in 2008 experienced much higher downgrades rates than historically observed for securities in their first year of seasoning. This creates an inconsistency between the downgrade counts shown in Exhibit 4 and some of the downgrade statistics in Exhibit 6. Exhibit 4 counts all securities that experienced a net

downgrade during 2008, regardless of when the security was issued, while the transition statistics in Exhibits 6A, 6B, and 6C only cover rating changes for ratings that were outstanding as of the beginning of the year.<sup>3</sup> For example, the 12-month downgrade rate for 2008 is calculated as a percentage of the ratings that were outstanding as of 1/1/08 that had a lower rating as of 12/31/08 (or before withdrawal, as the case may be). Therefore, securities that were issued during 2008 would not be counted in this calculation. This was not a significant issue in previous years because not many securities experienced rating changes within the first year of their lives.

To put this into context, Exhibit 6F graphs the cumulative downgrade rate by seasoning of various vintage groupings. Securities issued pre-2007 experienced negligible downgrade activity in the first year of seasoning. For securities in the 2007 vintage that had been seasoned 12 months, 13% had already experienced a downgrade, and for securities issued in 2008 that had reached 6 months of seasoning, almost 2% had already experienced a downgrade. Of course, the 2008 vintage was exposed to more stringent underwriting standards and has therefore performed better than the 2007 cohort at the same level of seasoning.

**Exhibit 6F: Cumulative Downgrade Rate by Seasoning and Vintage**



### **Comparison to Structured Finance Rating Transitions excluding SF CDOs, 2005-2007 vintage US HEL and RMBS**

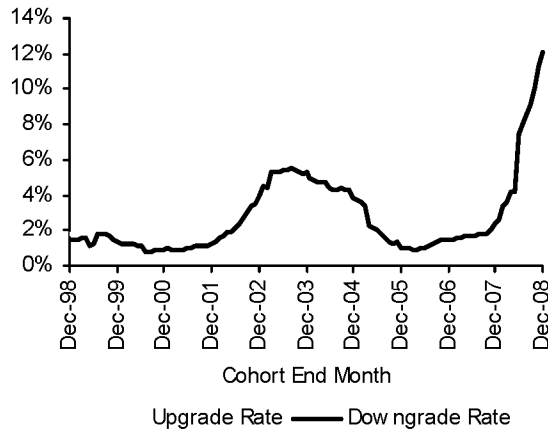
Excluding the poor performing vintages/asset classes causes the 12-month downgrade rate for 2008 to drop to 12.1% from 35.5% and the average number of notches downgraded to drop to 5.2 notches from 8.3 notches (when all sectors and vintages are included). The upgrade rate climbs to 1.3% from 0.7% while the average magnitude of upgrades stays relatively flat in 2008 at 2.1 (Exhibits 6A, 6B, 6E, 7A, 7B and 7E). Both the fallen angel rate and the Aaa downgrade rate drop to 4.1% and 10.4% from 19.2% and 26.1% respectively (Exhibits 6C and 7C).

Exhibit 7D shows the cumulative transition rates of securities issued between 1983 and 2008. Excluding the poor performing asset classes and vintages would boost the Aaa ratings stability rate to 94.4% from 83.4%. The other broad rating categories would retain around 65% of their original ratings and lose the remaining 35% more evenly to an upgrade or downgrade event.

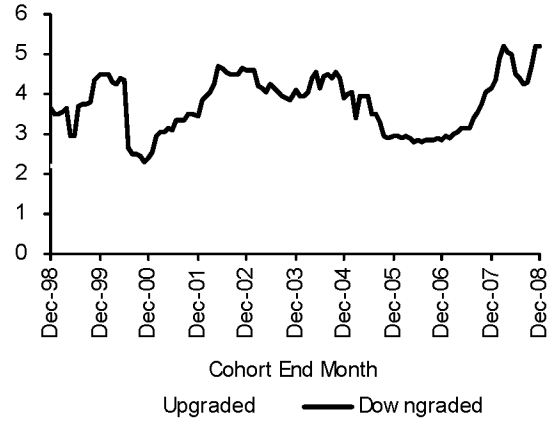
<sup>3</sup> This is not true of Exhibit 6D which includes all securities issued between 1983 and 2008.

**Exhibit 7: Global Structured Finance Rating Transition Trends excl SF CDOs, Other, and '05-'07 Vintage US HEL & RMBS**

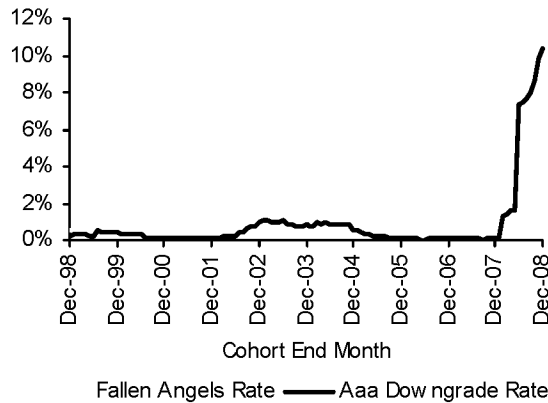
**Exhibit 7A: Upgrade and Downgrade Rates**



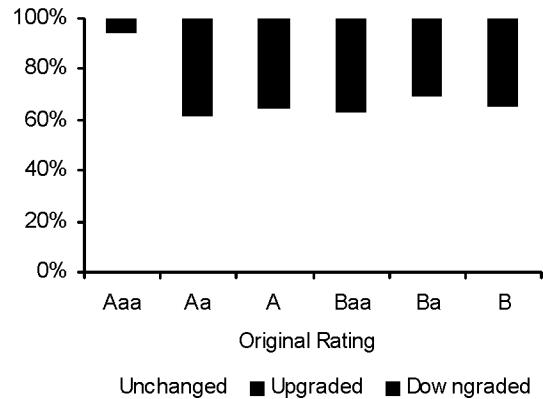
**Exhibit 7B: Average Number of Notches Upgraded or Downgraded**



**Exhibit 7C: Fallen Angel Rates and Aaa Downgrade Rates**



**Exhibit 7D: Cumulative Upgrade and Downgrade Rates by Original Rating**



**Exhibit 7E: Summary of Rating Transition Trends**

|  | 2008    | 2007   | 1999-2008 | 1999-2007 |
|--|---------|--------|-----------|-----------|
| Downgrade Rate                           | 12.11%  | 2.33%  | 3.18%     | 2.41%     |
| Upgrade Rate                             | 1.31%   | 3.58%  | 2.85%     | 2.95%     |
| Downgrade/Upgrade Ratio                  | 9.23    | 0.65   | 1.12      | 0.82      |
| Downgrade Rate (Notch Weighted)          | 63.23%  | 9.70%  | 13.37%    | 9.35%     |
| Upgrade Rate (Notch Weighted)            | 2.78%   | 8.13%  | 7.06%     | 7.42%     |
| Downgrade/Upgrade Ratio (Notch Weighted) | 22.74   | 1.19   | 1.89      | 1.26      |
| Rating Drift (Notch Weighted)            | -60.45% | -1.57% | -6.32%    | -1.93%    |
| Rating Volatility (Notch Weighted)       | 66.01%  | 17.83% | 20.43%    | 16.77%    |
| Stability Rate                           | 86.57%  | 94.09% | 93.97%    | 94.64%    |
| Average Number of Notches Downgraded     | 5.22    | 4.17   | 4.21      | 3.88      |
| Average Number of Notches Upgraded       | 2.12    | 2.27   | 2.48      | 2.51      |

## Downgrades of Aaa-rated Securities

Due to the apparent vulnerability of Aaa-rated securities to downgrades, Exhibit 8 takes a closer look at this phenomenon. Exhibit 8 shows the cumulative rating migration experience to date of securities originally rated Aaa for transactions securitized prior to 2006 and deals issued in 2006, 2007 and 2008 (excluding the other structured finance category).

For the pre-2006 vintages, the overall Aaa downgrade rate was 7.8% by count and 9.1% by volume and the transition rate into the non-investment grade categories was 1.3% by count and 1.6% volume. However, the Aaa downgrade rates for securities that closed in 2006 and 2007 have already surpassed those of the pre-2006 vintages, which is unique given the relatively unseasoned status of these securities.

For the 2006 vintage, 40.4% of securities originally rated Aaa have been downgraded by count and 29.4% by volume while, 13.1% by count and 11.5% by volume downgraded to a non-investment grade rating. Aaa-rated securities issued in 2007 have performed even worse with a 43.2% downgrade rate by count and 26.3% by volume. Transitions to below investment grade ratings are also more frequent for the 2007 vintage than for the other vintages at 17.9% by count and 12.5% by volume.

The 2008 vintage looks the best so far. However, given the relatively unseasoned status of these securities, not much can be inferred about this cohort yet.

**Exhibit 8: Cumulative Rating Transitions of Securities Originally Rated Aaa as of 12/31/08**

| <b>Pre-2006 Vintages</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa</b> | <b>Ca/C</b> |
|--------------------------|------------|-----------|----------|------------|-----------|----------|------------|-------------|
| By Count                 | 58,989     | 2,091     | 1,203    | 869        | 260       | 232      | 249        | 94          |
| % By Count               | 92.2%      | 3.3%      | 1.9%     | 1.4%       | 0.4%      | 0.4%     | 0.4%       | 0.1%        |
| By Volume (US\$ bil)     | 7908.8     | 332.5     | 136.0    | 175.4      | 36.5      | 52.6     | 47.6       | 11.9        |
| % By Volume              | 90.9%      | 3.8%      | 1.6%     | 2.0%       | 0.4%      | 0.6%     | 0.5%       | 0.1%        |
| <b>2006 Vintage</b>      | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa</b> | <b>Ca/C</b> |
| By Count                 | 8,068      | 1,196     | 1,369    | 1,141      | 620       | 374      | 370        | 410         |
| % By Count               | 59.6%      | 8.8%      | 10.1%    | 8.4%       | 4.6%      | 2.8%     | 2.7%       | 3.0%        |
| By Volume (US\$ bil)     | 1702.0     | 159.2     | 159.3    | 111.6      | 58.7      | 48.9     | 87.0       | 84.9        |
| % By Volume              | 70.6%      | 6.6%      | 6.6%     | 4.6%       | 2.4%      | 2.0%     | 3.6%       | 3.5%        |
| <b>2007 Vintage</b>      | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa</b> | <b>Ca/C</b> |
| By Count                 | 5,564      | 793       | 850      | 830        | 660       | 375      | 231        | 485         |
| % By Count               | 56.8%      | 8.1%      | 8.7%     | 8.5%       | 6.7%      | 3.8%     | 2.4%       | 5.0%        |
| By Volume (US\$ bil)     | 1468.3     | 92.1      | 89.0     | 93.7       | 52.2      | 59.1     | 34.3       | 103.6       |
| % By Volume              | 73.7%      | 4.6%      | 4.5%     | 4.7%       | 2.6%      | 3.0%     | 1.7%       | 5.2%        |
| <b>2008 Vintage</b>      | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa</b> | <b>Ca/C</b> |
| By Count                 | 1,342      | 34        | 0        | 4          | 3         | 1        | 1          | 0           |
| % By Count               | 96.9%      | 2.5%      | 0.0%     | 0.3%       | 0.2%      | 0.1%     | 0.1%       | 0.0%        |
| By Volume (US\$ bil)     | 1003.5     | 8.7       | 0.0      | 1.4        | 0.4       | 0.5      | 0.0        | 0.0         |
| % By Volume              | 98.9%      | 0.9%      | 0.0%     | 0.1%       | 0.0%      | 0.0%     | 0.0%       | 0.0%        |

*Note: Data does not include the Other Structured Finance category.*

## Transitions to Caa and Below

Another atypical feature of 2008 was the comparatively large proportion of downgrades into the lowest rating categories. Exhibit 9 shows the number and amount of securities downgraded to Caa and below by original rating category, again for the pre-2006 vintages, the 2006 vintage, the 2007 vintage and the 2008 vintage. By count, the overall transition rate to Caa and below is 5.6% for securities issued prior to 2006, 28.7% for securities issued in 2006, 23.8% for securities issued in 2007 and 0.4% for securities issued in 2008. By volume, the rates are 1.8%, 10.4%, 9.1% and 0.5%, respectively.

Comparing the overall downgrade rate between these three groups may be misleading because it does not control for differences in the rating distribution by closing year. In fact, there was a higher percentage of Aaa ratings and a lower percentage of speculative grade ratings in the pre-2006 vintages than in later vintages. However, even controlling for ratings, all securities rated Ba or higher that closed in 2006 or 2007 have similar or higher migration rates to Caa and below than securities that closed in 2005 or earlier. This is true despite the fact that the pre-2006 vintages are obviously more seasoned than the 2006 and 2007 vintages.

### Exhibit 9: Cumulative Rating Transitions to Caa and Below by Original Rating as of 12/31/08

| <b>Pre-2006 Vintages</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Total</b> |
|--------------------------|------------|-----------|----------|------------|-----------|----------|--------------|
| By Count                 | 343        | 520       | 1,016    | 2,642      | 1,050     | 339      | 5,910        |
| Total By Count           | 63,987     | 13,076    | 12,048   | 11,869     | 3,912     | 1,462    | 106,354      |
| % By Count               | 0.5%       | 4.0%      | 8.4%     | 22.3%      | 26.8%     | 23.2%    | 5.6%         |
| By Volume (US\$ bil)     | 59.5       | 20.9      | 24.6     | 56.0       | 12.4      | 4.9      | 178.3        |
| Total By Volume          | 8,701.2    | 654.6     | 422.0    | 304.0      | 62.8      | 15.2     | 10,159.8     |
| % By Volume              | 0.7%       | 3.2%      | 5.8%     | 18.4%      | 19.8%     | 32.0%    | 1.8%         |
| <b>2006 Vintage</b>      | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Total</b> |
| By Count                 | 780        | 1,610     | 2,318    | 2,602      | 871       | 54       | 8,235        |
| Total By Count           | 13,548     | 4,789     | 4,172    | 4,258      | 1,612     | 313      | 28,692       |
| % By Count               | 5.8%       | 33.6%     | 55.6%    | 61.1%      | 54.0%     | 17.3%    | 28.7%        |
| By Volume (US\$ bil)     | 171.9      | 44.6      | 34.1     | 28.7       | 7.8       | 0.3      | 287.4        |
| Total By Volume          | 2,411.6    | 140.2     | 103.4    | 88.3       | 23.5      | 3.8      | 2,770.8      |
| % By Volume              | 7.1%       | 31.8%     | 33.0%    | 32.5%      | 33.0%     | 7.8%     | 10.4%        |
| <b>2007 Vintage</b>      | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Total</b> |
| By Count                 | 716        | 1,004     | 1,264    | 1,384      | 314       | 49       | 4,731        |
| Total By Count           | 9,788      | 3,287     | 2,770    | 2,812      | 964       | 247      | 19,868       |
| % By Count               | 7.3%       | 30.5%     | 45.6%    | 49.2%      | 32.6%     | 19.8%    | 23.8%        |
| By Volume (US\$ bil)     | 137.9      | 26.9      | 18.6     | 19.7       | 3.0       | 1.8      | 208.0        |
| Total By Volume          | 1,992.5    | 100.3     | 81.6     | 93.3       | 16.0      | 4.2      | 2,287.8      |
| % By Volume              | 6.9%       | 26.8%     | 22.8%    | 21.2%      | 19.1%     | 42.9%    | 9.1%         |
| <b>2008 Vintage</b>      | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Total</b> |
| By Count                 | 1          |           | 5        | 1          |           | 4        | 11           |
| Total By Count           | 1,385      | 263       | 337      | 341        | 156       | 62       | 2,544        |
| % By Count               | 0.1%       | 0.0%      | 1.5%     | 0.3%       | 0.0%      | 6.5%     | 0.4%         |
| By Volume (US\$ bil)     | 0.0        | 0.0       | 4.4      | 1.0        | 0.0       | 0.8      | 6.2          |
| Total By Volume          | 1014.4     | 51.6      | 81.0     | 26.9       | 5.6       | 1.7      | 1181.2       |
| % By Volume              | 0.0%       | 0.0%      | 5.4%     | 3.6%       | 0.0%      | 48.1%    | 0.5%         |

Note: Data does not include the Other Structured Finance category.

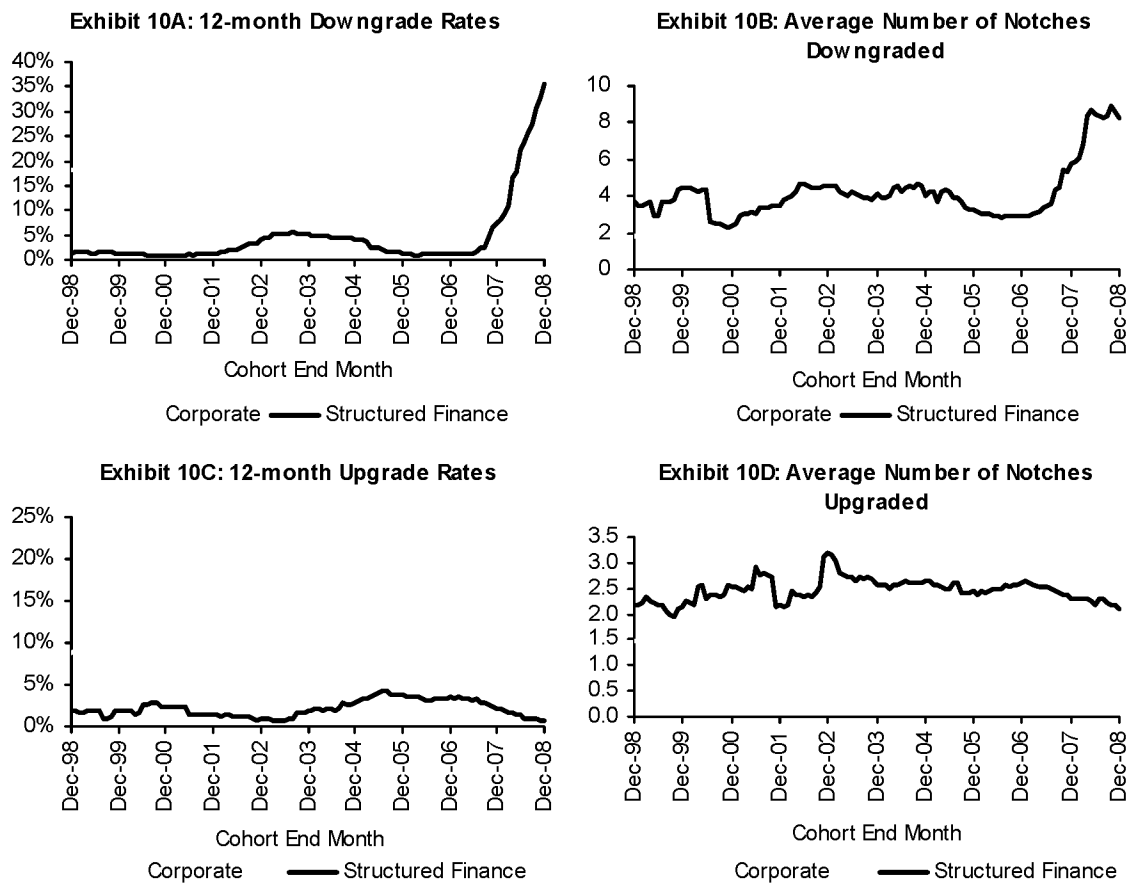


## Comparison to Corporate Rating Transitions

The rating transition experience of the structured finance and corporate finance markets<sup>4</sup> continued to diverge in 2008 even though both sectors saw their downgrade rates rise in 2008 (Exhibit 10). The past experience has been that corporate ratings are much less stable than structured ratings, but when rating changes do occur, the average magnitude of the change is much lower for corporate finance than structured finance. In 2008, not only did the structured finance downgrade rate far exceed the corporate, but the difference in the size of rating downgrades ballooned (8.3 notches for structured versus 1.6 notches for corporate).

Both the structured finance upgrade rate and the corporate upgrade rate dropped considerably, because of the deteriorating macroeconomic environment. The magnitude of rating upgrades also declined slightly in both sectors, remaining about a notch apart from each other.

**Exhibit 10: Comparison of Rating Transition Trends for Corporate and Structured Finance**



<sup>4</sup> The structured finance and corporate transition statistics presented in this section use different methodologies in treating rating withdrawals. The structured finance statistics use the rating before WR as the end rating, while the corporate statistics exclude non-defaulted withdrawn ratings from the calculation. In addition, defaults are treated as downgrades for the corporate sector.

**Exhibit 10E: Summary of Rating Transition Trends**

|  | Structured Finance |           | Corporate Finance |           |
|--|--------------------|-----------|-------------------|-----------|
|  | 2008               | 1984-2008 | 2008              | 1984-2008 |
| Downgrade Rate                           | 35.50%             | 6.25%     | 18.22%            | 13.47%    |
| Upgrade Rate                             | 0.69%              | 2.24%     | 4.64%             | 9.86%     |
| Downgrade/Upgrade Ratio                  | 51.59              | 2.79      | 3.92              | 1.37      |
| Downgrade Rate (Notch Weighted)          | 294.64%            | 43.64%    | 29.96%            | 23.91%    |
| Upgrade Rate (Notch Weighted)            | 1.46%              | 5.30%     | 6.24%             | 14.67%    |
| Downgrade/Upgrade Ratio (Notch Weighted) | 202.26             | 8.24      | 4.80              | 1.63      |
| Rating Drift (Notch Weighted)            | -293.18%           | -38.35%   | -23.72%           | -9.24%    |
| Rating Volatility (Notch Weighted)       | 296.09%            | 48.94%    | 36.20%            | 38.58%    |
| Stability Rate                           | 63.81%             | 91.52%    | 77.14%            | 76.67%    |
| Average Number of Notches Downgraded     | 8.30               | 6.99      | 1.64              | 1.78      |
| Average Number of Notches Upgraded       | 2.12               | 2.37      | 1.34              | 1.49      |

Exhibit 11 compares the 12-month rating transition matrices for global structured finance and global corporate finance in 2008 and averaged over the period 1984 to 2008. For the 2008 cohort and 1984-2008 cohort, structured finance securities were less stable than their corporate counterparts and experienced much higher downgrade rates. This contrasts with the historical experience when all structured finance rating categories were more stable. In addition, across rating categories, structured finance securities were also much more likely to be downgraded to Caa and below than were corporate securities, which is actually consistent with past experience.

### Exhibit 11: Global Structured Finance and Global Corporate Finance 12-month Rating Transition Matrices

#### Structured Finance in 2008

|               | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below |
|---------------|--------|--------|--------|--------|--------|--------|---------------|
| Aaa           | 73.89% | 7.23%  | 6.31%  | 5.32%  | 2.84%  | 1.74%  | 2.66%         |
| Aa            | 1.00%  | 55.51% | 7.29%  | 5.68%  | 4.83%  | 7.98%  | 17.71%        |
| A             | 0.27%  | 0.92%  | 58.86% | 7.72%  | 4.78%  | 6.39%  | 21.07%        |
| Baa           | 0.10%  | 0.05%  | 0.82%  | 55.42% | 5.47%  | 6.26%  | 31.88%        |
| Ba            | 0.05%  | 0.02%  | 0.05%  | 0.67%  | 54.67% | 3.81%  | 40.74%        |
| B             |        |        |        | 0.09%  | 0.21%  | 45.65% | 54.04%        |
| Caa and below |        |        |        |        |        | 0.13%  | 99.87%        |

#### Structured Finance: 1984-2008 average over 12-month horizon

|               | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below |
|---------------|--------|--------|--------|--------|--------|--------|---------------|
| Aaa           | 97.79% | 0.76%  | 0.53%  | 0.37%  | 0.19%  | 0.14%  | 0.21%         |
| Aa            | 5.27%  | 87.19% | 2.14%  | 1.12%  | 0.80%  | 1.72%  | 1.77%         |
| A             | 1.10%  | 3.26%  | 85.61% | 3.28%  | 1.39%  | 2.02%  | 3.34%         |
| Baa           | 0.37%  | 0.47%  | 2.46%  | 83.17% | 3.46%  | 2.92%  | 7.14%         |
| Ba            | 0.15%  | 0.07%  | 0.45%  | 2.46%  | 82.33% | 3.56%  | 10.98%        |
| B             | 0.07%  | 0.04%  | 0.08%  | 0.34%  | 1.95%  | 83.63% | 13.89%        |
| Caa and below | 0.03%  |        |        | 0.07%  | 0.08%  | 0.51%  | 99.30%        |

#### Corporate Finance in 2008

|               | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below |
|---------------|--------|--------|--------|--------|--------|--------|---------------|
| Aaa           | 95.85% | 4.15%  |        |        |        |        |               |
| Aa            | 4.43%  | 91.25% | 4.12%  | 0.10%  |        | 0.10%  |               |
| A             |        | 10.02% | 87.10% | 2.69%  | 0.06%  |        | 0.13%         |
| Baa           |        | 0.18%  | 7.30%  | 88.63% | 3.60%  | 0.28%  |               |
| Ba            |        |        | 0.18%  | 8.06%  | 83.70% | 7.33%  | 0.73%         |
| B             | 0.10%  |        |        | 0.19%  | 6.67%  | 83.60% | 9.44%         |
| Caa and below |        |        |        |        |        | 15.12% | 84.88%        |

#### Corporate Finance: 1984-2008 average over 12-month horizon

|               | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below |
|---------------|--------|--------|--------|--------|--------|--------|---------------|
| Aaa           | 92.76% | 6.97%  | 0.26%  |        | 0.02%  |        |               |
| Aa            | 1.26%  | 91.45% | 6.95%  | 0.27%  | 0.05%  | 0.02%  | 0.01%         |
| A             | 0.07%  | 3.01%  | 90.91% | 5.30%  | 0.55%  | 0.11%  | 0.04%         |
| Baa           | 0.05%  | 0.21%  | 5.37%  | 88.33% | 4.53%  | 1.00%  | 0.51%         |
| Ba            | 0.01%  | 0.06%  | 0.43%  | 6.48%  | 81.47% | 9.56%  | 2.00%         |
| B             | 0.01%  | 0.05%  | 0.18%  | 0.40%  | 6.16%  | 81.72% | 11.47%        |
| Caa and below |        | 0.03%  | 0.04%  | 0.19%  | 0.67%  | 11.44% | 87.63%        |

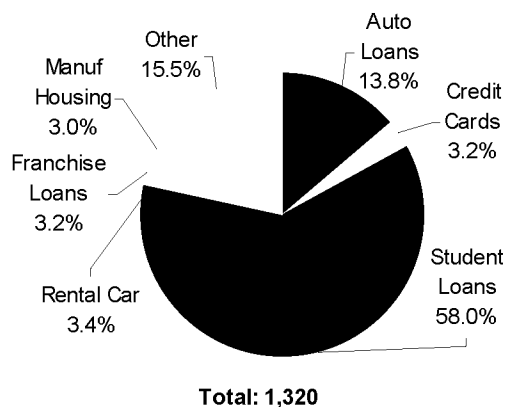
## Sector Specific Analysis of Rating Transitions

### US ABS ex HEL

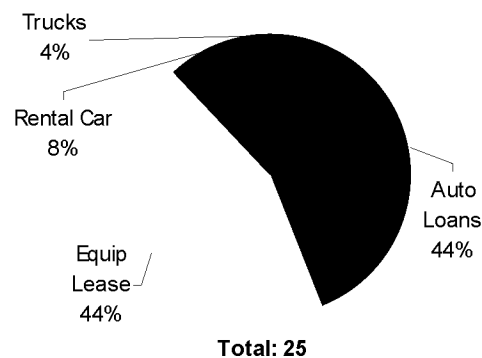
The US ABS excluding HEL sector saw a total of 1320 ratings from 400 deals downgraded and 25 ratings from 19 deals upgraded in 2008. Most of the downgrades (80.7%) were caused by the downgrades of the financial guarantors backing these transactions and the modification of Moody's approach to rating a structured finance security that is wrapped by a financial guarantor in November 2008.<sup>5</sup> Moody's current rating for a wrapped tranche is now the higher of (i) the guarantor's financial strength rating or (ii) the current underlying rating (i.e., absent consideration of the guaranty) on the security, regardless of whether the underlying rating is published or not. If Moody's is unable to determine the underlying rating or if an issuer has requested that the guaranty constitute the sole credit consideration, the wrapped security will take the rating of the financial guarantor. This announcement led to downgrades across the entire ABS universe claiming 99% of all downgrades in the auto loans sector followed by 82% of all downgrades in the student loans sector, 75% of all downgrades in the manufactured housing sector and 67.5% of all downgrades in the remaining sectors (Exhibit 12).

**Exhibit 12: Distribution of US ABS Rating Changes in 2008**

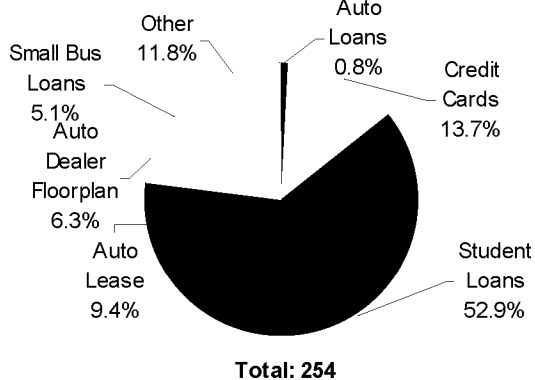
**Exhibit 12A: Downgrades by Asset Class**



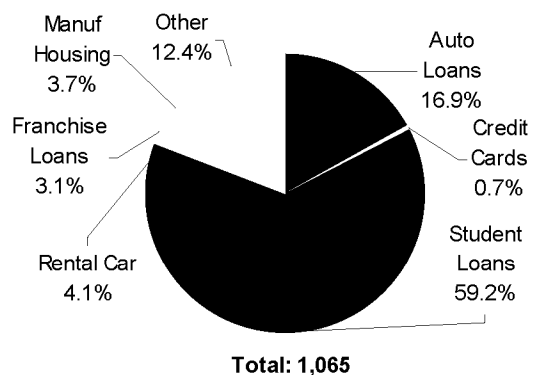
**Exhibit 12B: Upgrades by Asset Class**



**Exhibit 12C: Downgrades of Non-wrapped Securities by Asset Class**



**Exhibit 12D: Downgrades of Wrapped Securities by Asset Class**



In addition to the financial guarantor related downgrades, the remaining 135 transactions backed by student loans were downgraded due to worse than expected collateral performance, negative changes to back-up servicer arrangements following the bankruptcy filing of The Education Resources Institute (TERI), increased funding costs of LIBOR and Prime rates and excess spread compression due to the prolonged and continuing dislocations in the Student Loan Auction Rate Securities (SLARS) market.<sup>6</sup> Thirty-five transactions backed by

<sup>5</sup> See "Moody's modifies approach to rating structured finance securities wrapped by financial guarantors", November 10, 2008.

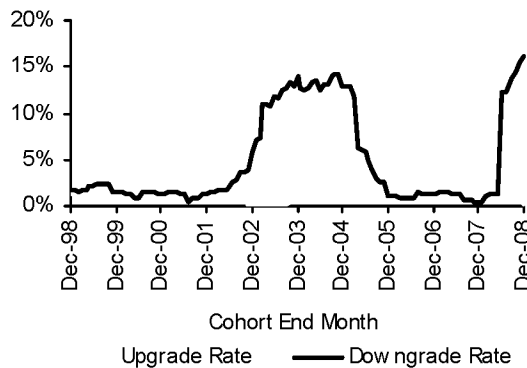
<sup>6</sup> See "Rating Changes in the US Asset Backed Securities Market: 2008 Fourth Quarter Update", January 27, 2009.

credit cards were downgraded as a result of the weakening of WAMU as seller/servicer and Specialty finance – Conn's exposure to mostly subprime obligors. Twenty-four auto lease tranches saw residual values stressed in the challenging environment and were consequently downgraded. Sixteen auto floorplans and nine franchise loan tranches were downgraded as a result of poor performance and distress in the auto manufacturing industry and bankruptcy in the restaurant industry. The remaining 36 downgrades across the various other ABS categories were caused by any and all combinations of poor performance of the portfolio, downgrades of insurers (like AIG), banks and timber companies and low credit enhancement relative to the stressed enhancement levels.

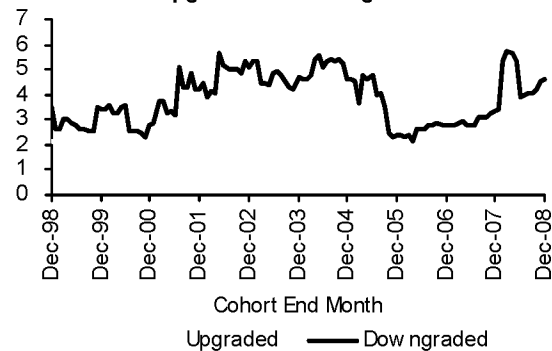
Eighteen of the 25 upgrades were from the 2005 vintage; the remaining seven were evenly distributed across the 2003, 2004, 2006 and 2008 vintages. Eleven tranches backed by auto loans, eleven tranches backed by equipment leases, three tranches backed by rental cars and one tranche backed by truck receivables all benefited from a strengthening in the credit profile of the securities, based upon the actual performance of the transactions and the build up of credit enhancement relative to expected future losses in the underlying receivables pools.

**Exhibit 13: US ABS ex HEL Rating Transition Trends**

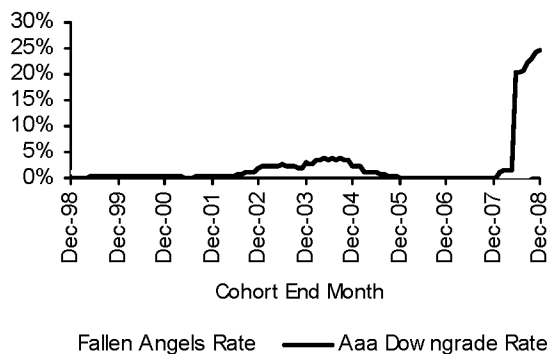
**Exhibit 13A: Upgrade and Downgrade Rates**



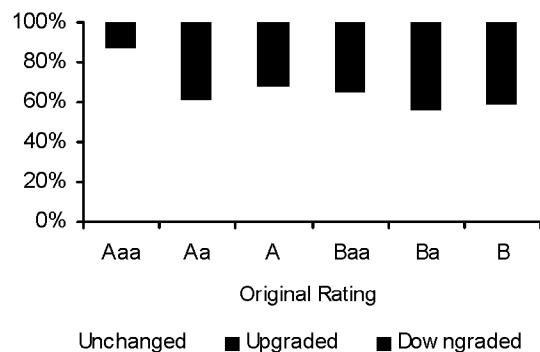
**Exhibit 13B: Average Number of Notches Upgraded or Downgraded**



**Exhibit 13C: Fallen Angel Rates and Aaa Downgrade Rates**



**Exhibit 13D: Cumulative Upgrade and Downgrade Rates by Original Rating**



**Exhibit 13E: Summary of Rating Transition Trends**

|  | 2008    | 2007   | 1999-2008 | 1999-2007 |
|--|---------|--------|-----------|-----------|
| Downgrade Rate                           | 16.12%  | 0.44%  | 5.46%     | 4.98%     |
| Upgrade Rate                             | 0.29%   | 2.46%  | 1.54%     | 1.61%     |
| Downgrade/Upgrade Ratio                  | 56.30   | 0.18   | 3.53      | 3.09      |
| Downgrade Rate (Notch Weighted)          | 74.43%  | 1.45%  | 24.65%    | 22.79%    |
| Upgrade Rate (Notch Weighted)            | 0.57%   | 5.16%  | 3.75%     | 3.88%     |
| Downgrade/Upgrade Ratio (Notch Weighted) | 130.00  | 0.28   | 6.58      | 5.88      |
| Rating Drift (Notch Weighted)            | -73.86% | 3.71%  | -20.90%   | -18.91%   |
| Rating Volatility (Notch Weighted)       | 75.01%  | 6.61%  | 28.39%    | 26.67%    |
| Stability Rate                           | 83.59%  | 97.11% | 93.00%    | 93.41%    |
| Average Number of Notches Downgraded     | 4.62    | 3.33   | 4.52      | 4.58      |
| Average Number of Notches Upgraded       | 2.00    | 2.10   | 2.43      | 2.41      |

For the US ABS excluding HEL sector in 2008 (see Exhibit 13):

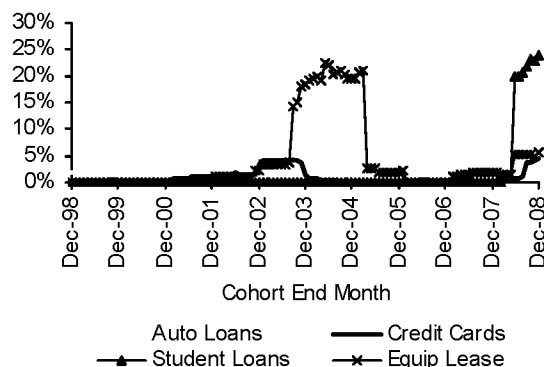
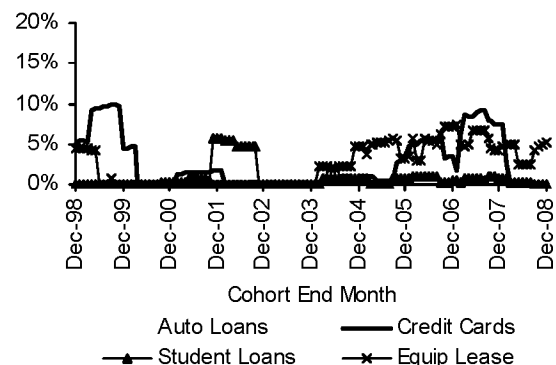
The frequency of downgrades rose to 16.1% from 0.4% in 2007, while the upgrade rate declined from 2.5% to 0.3%.

The average magnitude of rating downgrades rose 1.3 notches from 3.3 to 4.6, while the magnitude of upgrades fell from 2.1 to 2 notches in 2008.

The fallen angel rate crept up to 1.3% from 0.1% in 2007 while the Aaa downgrade rate increased to 25% in 2008 from 0% in 2007.

Securities originally rated Aaa still maintain a stability rate of 87%, but for most other rating categories (with the exception of single-A) cumulative downgrade rates have exceeded cumulative upgrade rates to date.

Exhibit 14 plots the 12-month downgrade and upgrades rates for the major ABS asset classes, excluding HEL. After defying the slowdown for most of 2007, traditional consumer asset classes like transactions backed by auto loans, credit card receivables, and student loans finally succumbed to the challenging environment and experienced unprecedented spikes in their downgrade rates. The upgrade rates for these sectors also remain well below their historical averages. Meanwhile, the equipment lease sector was one of the few sectors that continued to experience vastly improved performance compared to 2003 and 2004, when the bankruptcy of one issuer caused downgrade rates to rise to 22.3%.

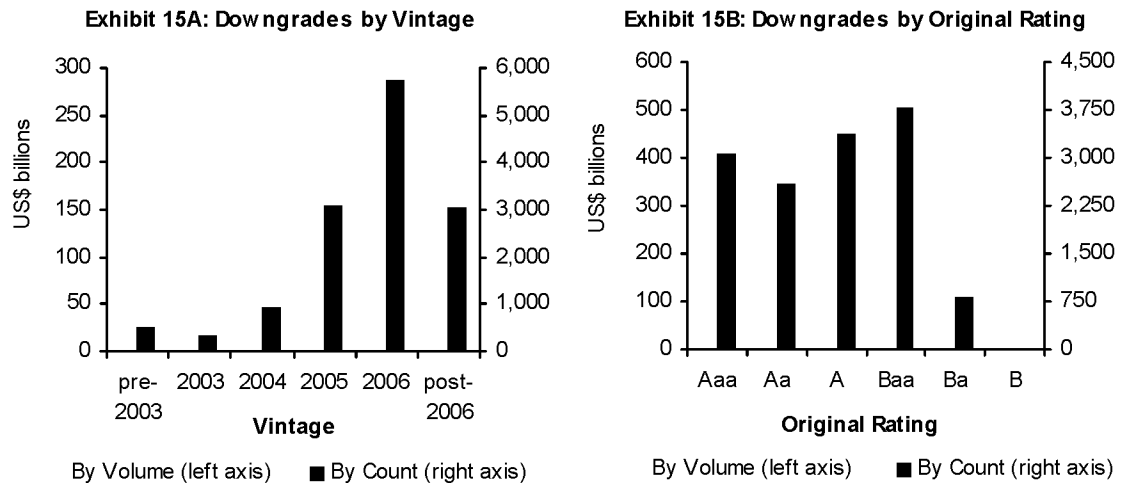
**Exhibit 14: 12-month Transition Rates for Select US ABS Asset Classes****Exhibit 14A: 12-month Downgrade Rates****Exhibit 14B: 12-month Upgrade Rates**

## US HEL (includes subprime)

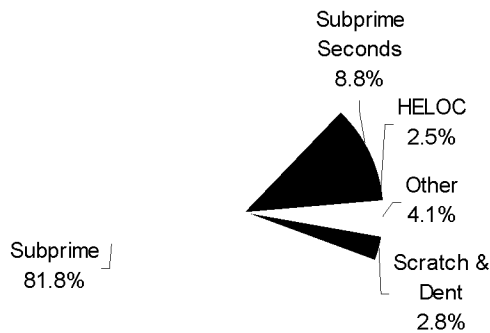
The worst downturn in the post-World War II period continued to impact the subprime residential mortgage market. The effect on the structured finance market was that 13,601 US HEL tranches from 1,982 deals were downgraded in 2008 and 16 tranches from 6 deals were upgraded.

The downgrades were concentrated in the 2005, 2006 and 2007 vintages, which accounted for 22.6%, 42.3% and 22.4% of the downgrades respectively by count, and 13.7%, 42.6% and 24.6% of the downgrades respectively by volume (Exhibit 15A). The poor performance of these vintages is attributed to macro-environment stresses like the worsening home price environment, rising unemployment and a continued lack of refinancing opportunities. These factors coupled with weaker mortgage credit quality and financial guarantor downgrades resulted in Moody's revising its projected losses in 2008<sup>7</sup> which ultimately resulted in downgrades across the capital structure and across asset classes. Even for 2009, the situation continues to remain bleak and more downgrades are expected.

**Exhibit 15: US HEL Downgrades in 2008**

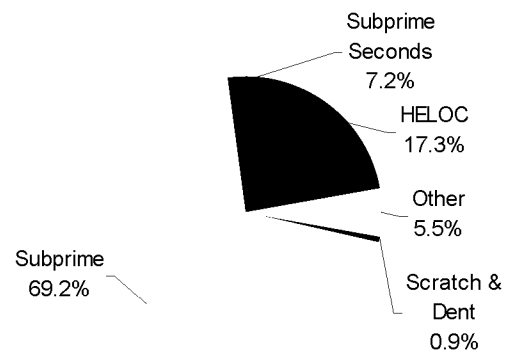


**Exhibit 15C: Count of downgrades by Loan Type**



Total Number of Downgrades: 13,601

**Exhibit 15D: Volume of downgrades by Loan Type**



Total Number of Downgrades: 13,601

By count, the Baa-rated securities experienced the most number of downgrades but, by volume, it was the Aaa-rated securities that were downgraded most (Exhibit 15B). By loan type, Subprime is dominant in this sector. Not surprisingly this sector experienced 82% of the downgrades by count and 69% of the downgrades by volume (Exhibit 15C and 15D).

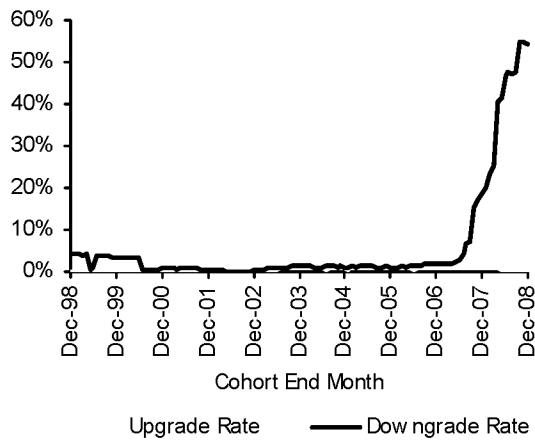
<sup>7</sup> See "Subprime RMBS Loss Projection Update: September 2008", dated September 18, 2008.

Out of 13,601 downgrades, 1,060 downgrades were caused by downgrades to financial guarantors and Moody's analysts' aligning the rating of the structured finance security with the revised rating of the financial guarantor. The remaining 12,541 downgrades were typically caused by poor performance of the underlying loan portfolio, erosion of credit enhancement provided by subordination, over-collateralization and/or excess spread relative to updated expected losses.

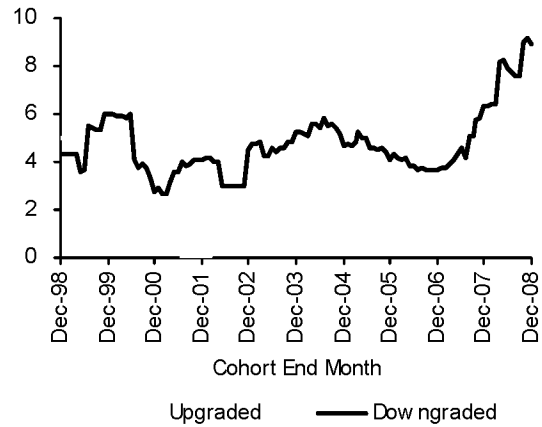
There were 16 upgrades for the sector in 2008, but those upgrades were limited to tranches that were originally rated high in the investment grade bucket and derived the benefits of seasoning. Thirteen of those 16 upgrades were linked to transactions issued in 2004 while the remaining three were issued in June 2005. The positive rating actions were caused by a strong build-up in credit enhancement and/or better than anticipated loan performance.

**Exhibit 16: US HEL Rating Transition Trends**

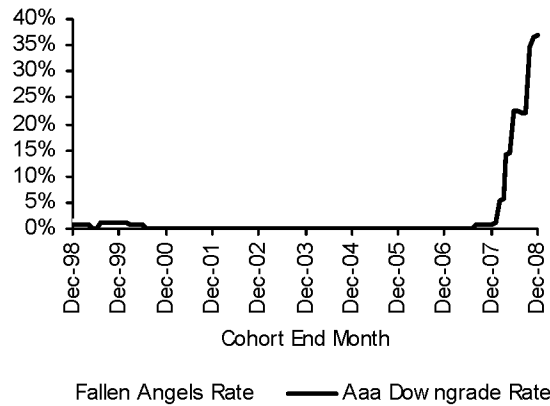
**Exhibit 16A: Upgrade and Downgrade Rates**



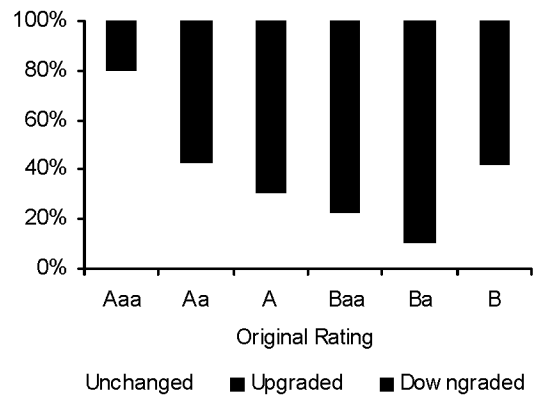
**Exhibit 16B: Average Number of Notches Upgraded or Downgraded**



**Exhibit 16C: Fallen Angel Rates and Aaa Downgrade Rates**



**Exhibit 16D: Cumulative Upgrade and Downgrade Rates by Original Rating**





**Exhibit 16E: Summary of Rating Transition Trends**

|  | 2008     | 2007     | 1999-2008 | 1999-2007 |
|--|----------|----------|-----------|-----------|
| Downgrade Rate                           | 54.29%   | 18.52%   | 13.75%    | 3.01%     |
| Upgrade Rate                             | 0.06%    | 1.04%    | 0.87%     | 1.00%     |
| Downgrade/Upgrade Ratio                  | 849.88   | 17.80    | 15.88     | 3.03      |
| Downgrade Rate (Notch Weighted)          | 484.21%  | 116.52%  | 104.70%   | 15.71%    |
| Upgrade Rate (Notch Weighted)            | 0.11%    | 2.15%    | 2.12%     | 2.55%     |
| Downgrade/Upgrade Ratio (Notch Weighted) | 4331.25  | 54.08    | 49.39     | 6.17      |
| Rating Drift (Notch Weighted)            | -484.10% | -114.36% | -102.58%  | -13.17%   |
| Rating Volatility (Notch Weighted)       | 484.32%  | 118.67%  | 106.82%   | 18.26%    |
| Stability Rate                           | 45.64%   | 80.44%   | 85.38%    | 95.99%    |
| Average Number of Notches Downgraded     | 8.92     | 6.29     | 7.61      | 5.21      |
| Average Number of Notches Upgraded       | 1.75     | 2.07     | 2.45      | 2.56      |

For the US HEL sector in 2008 (see Exhibit 16):

The frequency of downgrades increased from 18.5% in 2007 to 54.3% in 2008, while the frequency of upgrades decreased from 1% to 0.06% over the same time.

The average magnitude of rating downgrades rose by more than 2.5 notches to 8.9 in 2008 from 6.3 in 2007, while the magnitude of upgrades trended lower to 1.8 notches from 2.1 notches.

The fallen angel rate was 11.6% for the cohort ending December 2007 and had been below 1.7% from 1998 to 2007H1. For the cohort ending December 2008, the frequency of fallen angels increased more than 3-fold to 35.1%, from 2007 levels. The Aaa-downgrade rate also increased from 0.9% a year ago to 37.1%.

Despite the extreme rating volatility of 2008, Aaa-rated US HEL securities have still exhibited relative stability of around 80% to date. However, securities carrying original ratings of double-A or lower have all experienced high cumulative downgrade rates.

Since transactions backed by first and second lien subprime mortgages account for the vast majority of the US HEL universe, and those issued between 2005 and 2007 account for most of the rating actions in 2008, we focus on these vintages in the following exhibits. Exhibits 17 and 18 show the cumulative rating transition matrices for first and second lien subprime RMBS from the 2005, 2006, and 2007 vintages as of December 31, 2008.

Securities backed by first lien mortgages from the 2005 vintage that were originally rated Aaa still exhibited high stability rates. However, the 2006 and 2007 vintages have underperformed, usually displaying downgrade rates in excess of 50% across the capital structure.

**Exhibit 17A: US Subprime Rating Transitions - 2005 Vintage First Lien Transactions as of 12/31/08****Current Rating/Last Rating before WR**

| Orig Rtg | Aaa              | Aa             | A              | Baa            | Ba             | B              | Caa            | Ca             | C              |
|----------|------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Aaa      | 96.9%<br>(2,001) | 1.1%<br>(22)   | 0.4%<br>(9)    | 0.8%<br>(17)   | 0.3%<br>(6)    | 0.3%<br>(6)    | 0.1%<br>(3)    |                |                |
| Aa       |                  | 74.2%<br>(733) | 14.8%<br>(146) | 6.3%<br>(62)   | 2.0%<br>(20)   | 0.7%<br>(7)    | 1.0%<br>(10)   | 0.3%<br>(3)    | 0.7%<br>(7)    |
| A        |                  |                | 34.8%<br>(352) | 25.4%<br>(257) | 15.0%<br>(152) | 7.7%<br>(78)   | 6.0%<br>(61)   | 3.3%<br>(33)   | 7.8%<br>(79)   |
| Baa      |                  |                |                | 12.5%<br>(135) | 11.6%<br>(125) | 12.0%<br>(129) | 12.6%<br>(136) | 10.2%<br>(110) | 41.0%<br>(442) |
| Ba       |                  |                |                |                | 4.2%<br>(14)   | 3.0%<br>(10)   | 7.9%<br>(26)   | 13.9%<br>(46)  | 71.0%<br>(235) |

**Exhibit 18A: US Subprime Rating Transitions - 2005 Vintage Second Lien Transactions as of 12/31/08****Current Rating/Last Rating before WR**

| Orig Rtg | Aaa           | Aa            | A           | Baa           | Ba           | B             | Caa           | Ca           | C              |
|----------|---------------|---------------|-------------|---------------|--------------|---------------|---------------|--------------|----------------|
| Aaa      | 60.0%<br>(66) | 3.6%<br>(4)   | 1.8%<br>(2) | 11.8%<br>(13) | 9.1%<br>(10) | 3.6%<br>(4)   | 10.0%<br>(11) |              |                |
| Aa       | 8.0%<br>(8)   | 14.0%<br>(14) | 2.0%<br>(2) | 8.0%<br>(8)   | 5.0%<br>(5)  | 14.0%<br>(14) | 8.0%<br>(8)   | 7.0%<br>(7)  | 34.0%<br>(34)  |
| A        | 0.9%<br>(1)   | 0.9%<br>(1)   | 0.9%<br>(1) | 1.7%<br>(2)   | 4.3%<br>(5)  | 3.5%<br>(4)   | 5.2%<br>(6)   | 8.7%<br>(10) | 73.9%<br>(85)  |
| Baa      |               |               |             |               |              | 0.7%<br>(1)   | 2.1%<br>(3)   | 3.5%<br>(5)  | 93.8%<br>(135) |
| Ba       |               |               |             |               |              |               |               |              | 100.0%<br>(65) |

**Exhibit 17B: US Subprime Rating Transitions - 2006 Vintage First Lien Transactions as of 12/31/08****Current Rating/Last Rating before WR**

| Orig Rtg | Aaa              | Aa             | A             | Baa           | Ba            | B             | Caa            | Ca           | C                |
|----------|------------------|----------------|---------------|---------------|---------------|---------------|----------------|--------------|------------------|
| Aaa      | 52.5%<br>(1,109) | 10.8%<br>(228) | 9.0%<br>(191) | 9.5%<br>(201) | 6.5%<br>(138) | 5.9%<br>(124) | 5.4%<br>(114)  | 0.3%<br>(6)  |                  |
| Aa       |                  | 10.3%<br>(130) | 7.3%<br>(93)  | 9.7%<br>(123) | 9.5%<br>(120) | 9.0%<br>(114) | 11.6%<br>(147) | 5.6%<br>(71) | 37.0%<br>(468)   |
| A        |                  |                | 3.0%<br>(39)  | 3.0%<br>(39)  | 3.4%<br>(44)  | 4.3%<br>(56)  | 5.9%<br>(76)   | 2.9%<br>(38) | 77.5%<br>(1,004) |
| Baa      |                  |                |               | 0.7%<br>(9)   | 0.5%<br>(6)   | 1.2%<br>(15)  | 1.9%<br>(25)   | 1.4%<br>(18) | 94.4%<br>(1,220) |
| Ba       |                  |                |               |               |               | 0.2%<br>(1)   | 0.9%<br>(4)    | 1.1%<br>(5)  | 97.8%<br>(440)   |

**Exhibit 18B: US Subprime Rating Transitions - 2006 Vintage Second Lien Transactions as of 12/31/08****Current Rating/Last Rating before WR**

| Orig Rtg | Aaa           | Aa          | A           | Baa           | Ba          | B            | Caa           | Ca            | C              |
|----------|---------------|-------------|-------------|---------------|-------------|--------------|---------------|---------------|----------------|
| Aaa      | 10.9%<br>(20) | 3.8%<br>(7) |             | 14.1%<br>(26) | 2.7%<br>(5) | 9.8%<br>(18) | 21.2%<br>(39) | 26.6%<br>(49) | 10.9%<br>(20)  |
| Aa       |               | 2.2%<br>(4) |             |               |             |              | 2.2%<br>(4)   | 1.6%<br>(3)   | 94.0%<br>(172) |
| A        |               |             | 0.5%<br>(1) | 0.5%<br>(1)   |             |              |               | 0.5%<br>(1)   | 98.4%<br>(184) |
| Baa      |               |             |             |               |             | 0.5%<br>(1)  |               | 0.9%<br>(2)   | 98.6%<br>(211) |
| Ba       |               |             |             |               |             |              |               |               | 100.0%<br>(99) |

**Exhibit 17C: US Subprime Rating Transitions - 2007 Vintage First Lien Transactions as of 12/31/08****Current Rating/Last Rating before WR**

| Orig Rtg | Aaa            | Aa             | A              | Baa            | Ba             | B              | Caa           | Ca           | C              |
|----------|----------------|----------------|----------------|----------------|----------------|----------------|---------------|--------------|----------------|
| Aaa      | 27.5%<br>(291) | 10.2%<br>(108) | 12.5%<br>(132) | 15.6%<br>(165) | 11.6%<br>(123) | 13.8%<br>(146) | 8.3%<br>(88)  | 0.4%<br>(4)  | 0.2%<br>(2)    |
| Aa       |                | 3.3%<br>(21)   | 2.5%<br>(16)   | 5.9%<br>(38)   | 9.4%<br>(61)   | 9.9%<br>(64)   | 13.6%<br>(88) | 5.7%<br>(37) | 49.7%<br>(321) |
| A        |                |                | 1.9%<br>(12)   | 1.0%<br>(6)    | 2.3%<br>(14)   | 3.5%<br>(22)   | 3.9%<br>(24)  | 1.9%<br>(12) | 85.5%<br>(530) |
| Baa      |                |                |                | 1.6%<br>(9)    | 0.7%<br>(4)    | 0.5%<br>(3)    | 1.6%<br>(9)   | 0.3%<br>(2)  | 95.3%<br>(551) |
| Ba       |                |                |                |                | 1.6%<br>(2)    | 1.6%<br>(2)    | 0.8%<br>(1)   |              | 96.0%<br>(120) |

**Exhibit 18C: US Subprime Rating Transitions - 2007 Vintage Second Lien Transactions as of 12/31/08****Current Rating/Last Rating before WR**

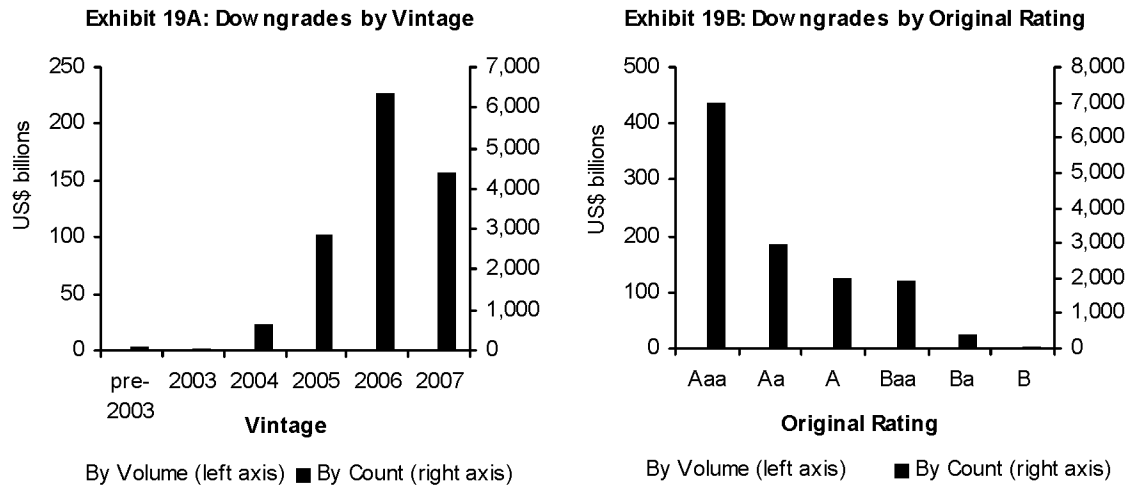
| Orig Rtg | Aaa         | Aa          | A           | Baa           | Ba          | B           | Caa          | Ca            | C             |
|----------|-------------|-------------|-------------|---------------|-------------|-------------|--------------|---------------|---------------|
| Aaa      | 6.2%<br>(4) | 7.7%<br>(5) | 3.1%<br>(2) | 32.3%<br>(21) | 1.5%<br>(1) | 6.2%<br>(4) | 10.8%<br>(7) | 26.2%<br>(17) | 6.2%<br>(4)   |
| Aa       |             | 4.3%<br>(2) |             |               | 2.2%<br>(1) |             | 2.2%<br>(1)  | 2.2%<br>(1)   | 89.1%<br>(41) |
| A        |             |             | 1.8%<br>(1) |               |             | 1.8%<br>(1) | 3.5%<br>(2)  |               | 93.0%<br>(53) |
| Baa      |             |             |             | 1.7%<br>(1)   |             |             |              | 1.7%<br>(1)   | 96.7%<br>(58) |
| Ba       |             |             |             |               |             |             |              | 5.3%<br>(1)   | 94.7%<br>(18) |

## US RMBS (includes Alt-A and Jumbo)

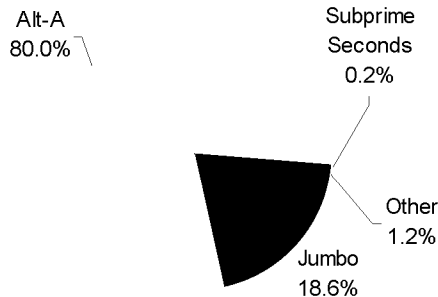
Just as many of the subprime mortgage pools backing HEL securities continued to be negatively impacted by the macro environment in 2008, so were many Alt-A and Jumbo mortgage pools backing RMBS. In fact, the number of downgrades in RMBS surpassed HEL for the first time in a decade. However, since by count RMBS is a much larger sector than HEL, by frequency and magnitude of downgrades RMBS fares better. In all, 14,386 US RMBS tranches from 1,416 deals were downgraded and 6 tranches from 2 deals were upgraded. In early 2009, Moody's announced updated Alt-A<sup>8</sup> and Option ARMs<sup>9</sup> loss projection numbers. This announcement should result in additional downgrades in 2009 as well.

Like the HEL sector, downgrades for US RMBS were concentrated in the more recent vintages. By count, the 2006 vintage comprised the bulk of the downgrades (44.2%), followed by the post-2006 vintages (30.5%), and the 2005 vintage (20%). Again, the investment grade ratings bore the brunt of the downgrades with fewer downgrades occurring among securities originally rated Ba or B. The majority of the downgrades were in the Alt-A sector (80% by count and 76.3% by volume), followed by the jumbo sector (18.6% of the downgrades by count and 22.2% by volume) (See Exhibit 19).

**Exhibit 19: US RMBS Downgrades in 2008**

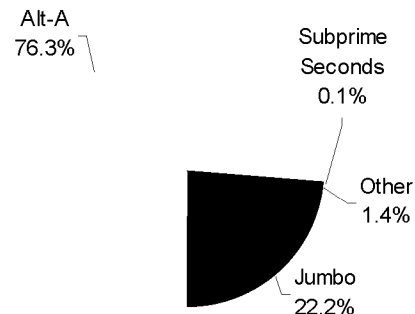


**Exhibit 19C: Count of downgrades by Loan Type**



**Total Number of Downgrades: 14,386**

**Exhibit 19D: Volume of downgrades by Loan Type**



**Total Number of Downgrades: 14,386**

Ninety-eight percent of the 14,386 ratings were downgraded as a result of higher than anticipated rates of delinquency, foreclosure, and REO in the underlying collateral relative to credit enhancement levels. The remaining 2% of the downgrades were caused by financial guarantor related downgrades. The six upgraded tranches were from two Resix Finance Limited Credit-Linked Notes, Series 2003-B and Series 2004-B. These

<sup>8</sup> See "Alt-A RMBS Loss Projection Update: January 2009", Rating Methodology, dated January 22, 2009.

<sup>9</sup> See "Option ARMs RMBS Loss Projection Update: February 2009", Rating Methodology, dated February 5, 2009.

synthetic securitizations reference portfolios were made up of primarily jumbo mortgages and benefited from subordination and seasoning. Out of the six upgrades, two tranches were from the 2003 vintage while the remaining four were from the 2004 vintage.

For the US RMBS sector in 2008 (see Exhibit 20):

After enjoying a 12-month downgrade rate of less than 1% for most of the last decade, the frequency of downgrades increased from 4.5% in 2007 to 37.3% in 2008. At the same time, the upgrade rate declined from 0.7% in 2007 to almost 0% in 2008.

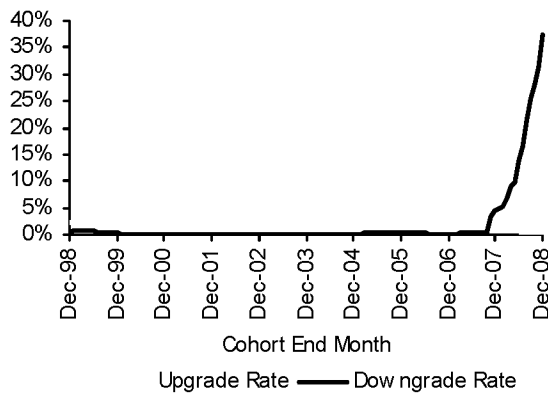
The average magnitude of rating downgrades rose more than three notches from 4.3 to 7.7, and the average size of rating upgrades increased to 2.7 notches from 2.1 notches.

Both the Aaa downgrade rate and Fallen angel rate increased to unprecedented levels: 26.1% and 17.2% respectively from 0% and 2.5% in 2007.

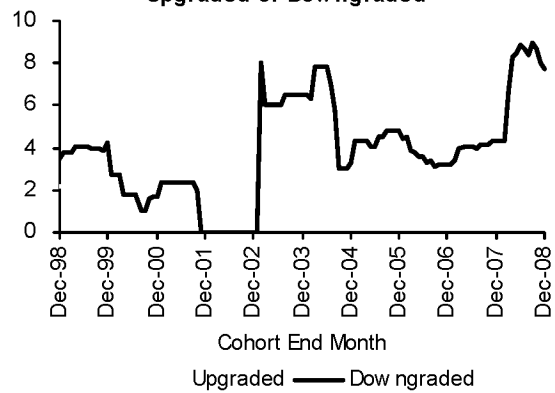
Securities originally rated Aaa experienced the highest stability rate of 83.6%. The single-A and Baa rating categories were most affected by the cumulative rating changes.

**Exhibit 20: US RMBS Rating Transition Trends**

**Exhibit 20A: Upgrade and Downgrade Rates**



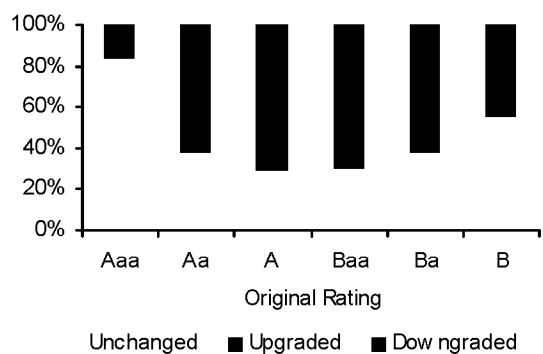
**Exhibit 20B: Average Number of Notches Upgraded or Downgraded**



**Exhibit 20C: Fallen Angel Rates and Aaa Downgrade Rates**



**Exhibit 20D: Cumulative Upgrade and Downgrade Rates by Original Rating**



**Exhibit 20E: Summary of Rating Transition Trends**

|  | 2008     | 2007    | 1999-2008 | 1999-2007 |
|--|----------|---------|-----------|-----------|
| Downgrade Rate                           | 37.31%   | 4.54%   | 5.04%     | 0.36%     |
| Upgrade Rate                             | 0.02%    | 0.72%   | 1.56%     | 1.99%     |
| Downgrade/Upgrade Ratio                  | 2397.00  | 6.29    | 3.23      | 0.18      |
| Downgrade Rate (Notch Weighted)          | 288.09%  | 19.62%  | 40.18%    | 1.53%     |
| Upgrade Rate (Notch Weighted)            | 0.04%    | 1.51%   | 4.07%     | 5.26%     |
| Downgrade/Upgrade Ratio (Notch Weighted) | 6941.25  | 12.99   | 9.88      | 0.29      |
| Rating Drift (Notch Weighted)            | -288.04% | -18.11% | -36.11%   | 3.73%     |
| Rating Volatility (Notch Weighted)       | 288.13%  | 21.13%  | 44.24%    | 6.79%     |
| Stability Rate                           | 62.68%   | 94.74%  | 93.40%    | 97.65%    |
| Average Number of Notches Downgraded     | 7.72     | 4.33    | 7.97      | 4.29      |
| Average Number of Notches Upgraded       | 2.67     | 2.09    | 2.61      | 2.64      |

The deteriorating performance of the home price environment makes the 2005, 2006, and 2007 Alt-A vintages and Jumbo vintages particularly susceptible to downgrades. Exhibits 21 and 22 display the cumulative transition matrices by original rating for these vintages as of December 31, 2008. The size of the 2005, 2006 and 2007 Alt-A vintages combined is roughly five times the size of the Jumbo sector of those same vintages, and while both the Alt-A and Jumbo categories have experienced cumulative downgrade rates of 52% and 49.5% respectively through the end of 2008, the Alt-A Aaa-rated tranches have held up better in this environment. Alt-A Aaa-rated securities experienced cumulative downgrades of 21.8% compared to the 43% cumulative downgrades in the Jumbo sector.

**Exhibit 21A: US Alt-A Rating Transitions - 2005 Vintage Transactions as of 12/31/08****Current Rating/Last Rating before WR**

| Orig Rtg | Aaa              | Aa             | A              | Baa            | Ba            | B              | Caa           | Ca             | C             |
|----------|------------------|----------------|----------------|----------------|---------------|----------------|---------------|----------------|---------------|
| Aaa      | 73.7%<br>(3,614) | 13.1%<br>(643) | 8.2%<br>(401)  | 3.2%<br>(155)  | 1.7%<br>(81)  | 0.2%<br>(10)   |               |                |               |
| Aa       | 0.3%<br>(3)      | 45.1%<br>(418) | 17.2%<br>(159) | 14.2%<br>(132) | 6.6%<br>(61)  | 10.0%<br>(93)  | 4.1%<br>(38)  | 1.9%<br>(18)   | 0.5%<br>(5)   |
| A        |                  | 0.5%<br>(3)    | 27.6%<br>(160) | 7.9%<br>(46)   | 12.1%<br>(70) | 17.4%<br>(101) | 10.0%<br>(58) | 19.7%<br>(114) | 4.7%<br>(27)  |
| Baa      |                  |                | 0.2%<br>(1)    | 24.5%<br>(155) | 6.2%<br>(39)  | 10.3%<br>(65)  | 9.6%<br>(61)  | 34.4%<br>(218) | 14.8%<br>(94) |
| Ba       |                  |                |                |                | 25.7%<br>(29) | 5.3%<br>(6)    | 4.4%<br>(5)   | 43.4%<br>(49)  | 21.2%<br>(24) |
| B        |                  |                |                |                |               | 47.8%<br>(11)  | 4.3%<br>(1)   | 21.7%<br>(5)   | 26.1%<br>(6)  |

**Exhibit 21B: US Alt-A Rating Transitions - 2006 Vintage Transactions as of 12/31/08**

## Current Rating/Last Rating before WR

| Orig Rtg | Aaa              | Aa             | A              | Baa           | Ba            | B              | Caa            | Ca             | C              |
|----------|------------------|----------------|----------------|---------------|---------------|----------------|----------------|----------------|----------------|
| Aaa      | 60.6%<br>(2,968) | 10.5%<br>(516) | 10.4%<br>(510) | 8.5%<br>(415) | 6.1%<br>(299) | 3.1%<br>(154)  | 0.7%<br>(32)   | 0.0%<br>(1)    |                |
| Aa       | 0.2%<br>(2)      | 18.2%<br>(240) | 7.2%<br>(95)   | 7.6%<br>(100) | 8.9%<br>(118) | 30.3%<br>(401) | 10.9%<br>(144) | 13.9%<br>(184) | 2.9%<br>(38)   |
| A        |                  |                | 5.1%<br>(45)   | 3.7%<br>(33)  | 2.2%<br>(19)  | 21.2%<br>(187) | 9.9%<br>(87)   | 38.3%<br>(338) | 19.7%<br>(174) |
| Baa      |                  |                |                | 3.7%<br>(30)  | 1.2%<br>(10)  | 10.9%<br>(89)  | 4.4%<br>(36)   | 40.6%<br>(330) | 39.1%<br>(318) |
| Ba       |                  |                |                |               | 0.7%<br>(1)   |                |                | 48.6%<br>(72)  | 50.7%<br>(75)  |
| B        |                  |                |                |               |               |                |                | 50.0%<br>(7)   | 50.0%<br>(7)   |

**Exhibit 21C: US Alt-A Rating Transitions - 2007 Vintage Transactions as of 12/31/08**

## Current Rating/Last Rating before WR

| Orig Rtg | Aaa              | Aa             | A              | Baa           | Ba            | B              | Caa           | Ca             | C              |
|----------|------------------|----------------|----------------|---------------|---------------|----------------|---------------|----------------|----------------|
| Aaa      | 60.7%<br>(2,045) | 7.6%<br>(257)  | 11.3%<br>(382) | 8.1%<br>(274) | 7.2%<br>(241) | 3.8%<br>(127)  | 1.2%<br>(42)  | 0.0%<br>(1)    |                |
| Aa       |                  | 22.9%<br>(229) | 7.2%<br>(72)   | 7.4%<br>(74)  | 9.4%<br>(94)  | 30.6%<br>(306) | 7.9%<br>(79)  | 11.1%<br>(111) | 3.4%<br>(34)   |
| A        |                  |                | 6.5%<br>(38)   | 5.3%<br>(31)  | 6.7%<br>(39)  | 25.8%<br>(150) | 10.0%<br>(58) | 32.6%<br>(190) | 13.1%<br>(76)  |
| Baa      |                  |                |                | 3.5%<br>(18)  | 1.4%<br>(7)   | 16.3%<br>(84)  | 8.0%<br>(41)  | 44.9%<br>(231) | 26.0%<br>(134) |
| Ba       |                  |                |                |               |               | 4.9%<br>(4)    | 1.2%<br>(1)   | 64.2%<br>(52)  | 29.6%<br>(24)  |
| B        |                  |                |                |               |               |                |               | 72.2%<br>(13)  | 27.8%<br>(5)   |

**Exhibit 22A: US Jumbo Rating Transitions - 2005 Vintage Transactions as of 12/31/08**

## Current Rating/Last Rating before WR

| Orig Rtg | Aaa              | Aa             | A             | Baa           | Ba            | B              | Caa | Ca | C |
|----------|------------------|----------------|---------------|---------------|---------------|----------------|-----|----|---|
| Aaa      | 99.9%<br>(1,559) |                |               | 0.1%<br>(1)   |               |                |     |    |   |
| Aa       |                  | 99.5%<br>(199) | 0.5%<br>(1)   |               |               |                |     |    |   |
| A        |                  | 2.3%<br>(1)    | 95.5%<br>(42) |               | 2.3%<br>(1)   |                |     |    |   |
| Baa      |                  |                | 2.0%<br>(1)   | 94.0%<br>(47) | 2.0%<br>(1)   | 2.0%<br>(1)    |     |    |   |
| Ba       |                  |                |               | 5.0%<br>(1)   | 95.0%<br>(19) |                |     |    |   |
| B        |                  |                |               |               |               | 100.0%<br>(16) |     |    |   |

**Exhibit 22B: US Jumbo Rating Transitions - 2006 Vintage Transactions as of 12/31/08****Current Rating/Last Rating before WR**

| Orig Rtg | Aaa            | Aa             | A              | Baa            | Ba            | B            | Caa           | Ca           | C            |
|----------|----------------|----------------|----------------|----------------|---------------|--------------|---------------|--------------|--------------|
| Aaa      | 22.5%<br>(366) | 16.8%<br>(274) | 33.8%<br>(551) | 19.3%<br>(315) | 7.2%<br>(118) | 0.2%<br>(4)  | 0.1%<br>(1)   |              |              |
| Aa       |                | 15.1%<br>(30)  | 27.1%<br>(54)  | 14.6%<br>(29)  | 22.6%<br>(45) | 9.5%<br>(19) | 9.5%<br>(19)  | 1.5%<br>(3)  |              |
| A        |                |                | 7.1%<br>(1)    |                | 21.4%<br>(3)  |              | 35.7%<br>(5)  | 35.7%<br>(5) |              |
| Baa      |                |                |                | 13.3%<br>(2)   |               | 6.7%<br>(1)  | 26.7%<br>(4)  | 40.0%<br>(6) | 13.3%<br>(2) |
| Ba       |                |                |                |                |               |              | 75.0%<br>(3)  | 25.0%<br>(1) |              |
| B        |                |                |                |                |               |              | 100.0%<br>(2) |              |              |

**Exhibit 22C: US Jumbo Rating Transitions - 2007 Vintage Transactions as of 12/31/08****Current Rating/Last Rating before WR**

| Orig Rtg | Aaa            | Aa             | A              | Baa            | Ba             | B             | Caa          | Ca           | C            |
|----------|----------------|----------------|----------------|----------------|----------------|---------------|--------------|--------------|--------------|
| Aaa      | 21.1%<br>(240) | 19.1%<br>(217) | 19.5%<br>(222) | 13.7%<br>(156) | 21.9%<br>(249) | 4.0%<br>(46)  | 0.8%<br>(9)  |              |              |
| Aa       |                | 20.0%<br>(28)  | 2.9%<br>(4)    | 25.7%<br>(36)  | 23.6%<br>(33)  | 17.1%<br>(24) | 8.6%<br>(12) | 2.1%<br>(3)  |              |
| A        |                |                |                | 10.0%<br>(1)   | 30.0%<br>(3)   | 10.0%<br>(1)  | 10.0%<br>(1) | 40.0%<br>(4) |              |
| Baa      |                |                |                |                |                |               | 42.9%<br>(3) | 57.1%<br>(4) |              |
| Ba       |                |                |                |                |                |               | 66.7%<br>(2) |              | 33.3%<br>(1) |
| B        |                |                |                |                |                |               | 33.3%<br>(1) | 33.3%<br>(1) | 33.3%<br>(1) |

**US CMBS**

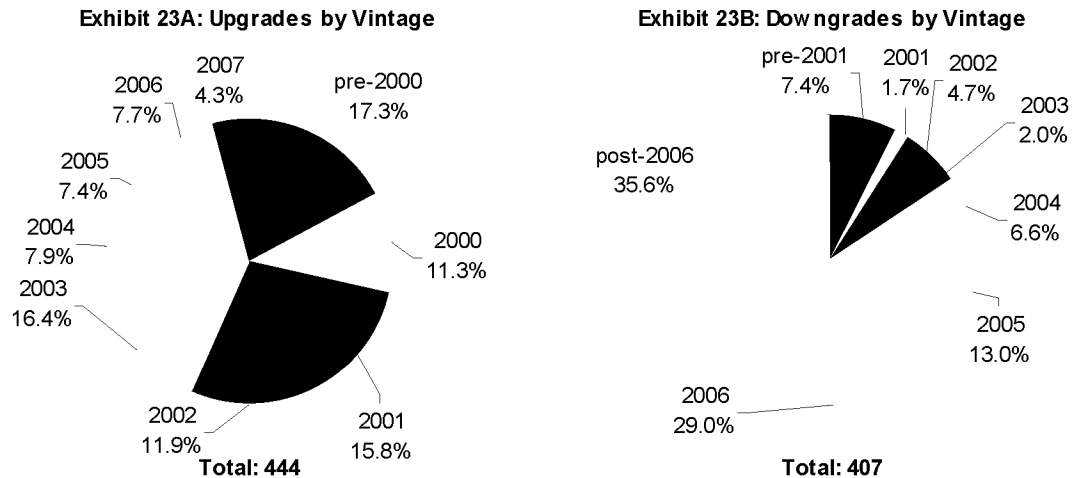
The US CMBS sector was one of the few sectors that had more upgrades than downgrades in 2008. In total, 444 ratings from 147 deals were upgraded and 407 ratings from 101 deals were downgraded in 2008. Increased subordination levels and defeasance were cited as the major cause for the great majority of CMBS upgrades, and for many, improved overall pool performance of the collateral or underlying pool was also a contributing factor. In addition, three transactions backed by net leases were upgraded to align the ratings with those of the bank/insurer guaranteeing the collateral.

Most of the CMBS downgrades resulted from realized and anticipated losses from specially serviced loans and LTV dispersion. The remaining eleven transactions backed by net leases and one CRE-CDO transaction were downgraded to align the ratings with those of the bank/insurer guaranteeing the collateral.

Upgrades were fairly evenly distributed across the vintages. Securities carrying investment-grade ratings at the beginning of the year were the main beneficiary of positive rating actions, contributing to 91.4% of upgrade activity. As was the case with HEL and RMBS downgrades, CMBS downgrades were concentrated in the post 2004 vintages, accounting for 77.6% of all downgrades (Exhibit 23).



### Exhibit 23: Distribution of US CMBS Rating Changes in 2008



While rating change activity for US CMBS has been relatively positive in recent years, concerns about declining property values and rising delinquencies caused Moody's to announce in February 2009 a ratings review of all U.S. commercial mortgage backed securities (CMBS) conduit and fusion transactions rated during the period from 2006 through 2008, and all large loan and single borrower transactions regardless of vintage. The review will reflect adjustments Moody's is making to two key inputs to its CMBS rating model: stressed capitalization rates and property cash flows. The transactions under review have an outstanding balance of \$302.6 billion, which represents 52% percent of all outstanding Moody's-rated U.S. CMBS by dollar volume.<sup>10</sup> As announced in December 2008, a review of commercial real estate collateralized debt obligations (CRE CDOs) is still being conducted and will reflect any changes in the ratings of the underlying CMBS bonds.

For the US CMBS sector in 2008 (see Exhibit 24):

The upgrade rate dropped from an all-time high of 16.5% in 2006 to 10.2% in 2007 and 4.7% in 2008, but still remained much higher than the upgrade rates of all other structured finance sectors. The downgrade rate rose more than 4-fold from 0.8 to 4.3%.

The average magnitude of upgrades declined slightly from 2.3 notches in 2007 to 1.8 notches in 2008, while the average magnitude of downgrades increased slightly from 2.0 notches to 2.3 notches in 2008.

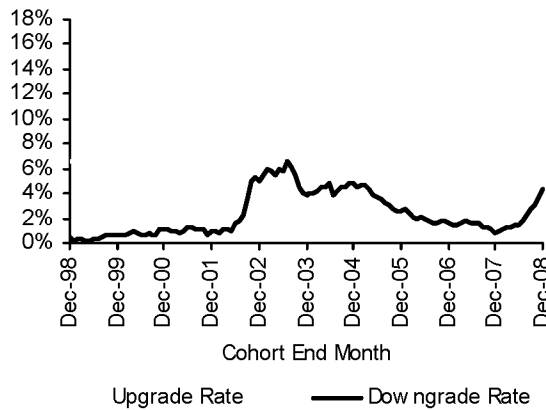
The fallen angel rate and Aaa downgrade rate were negligible in 2007. However, the fallen angel rate and the Aaa downgrade rate rose slightly to 1% and 0.01% respectively in 2008. This Aaa downgrade rate remains well below the spike in late 2002 through early 2003 following concerns about terrorism insurance coverage for some deals.

To date, the stability rate of Aaa-rated CMBS has been over 99%, while Aa and single-A rated CMBS have experienced roughly 40% cumulative upgrade rates. Only securities rated single-B have higher cumulative proportions of downgrades to upgrades.

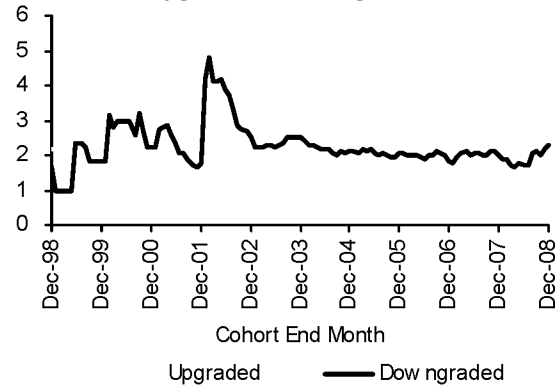
<sup>10</sup> See "Rating Methodology Update: U.S. CMBS Review Prompted by Declining Property Values and Rising Delinquencies", Methodology Report, dated February 5, 2009.

**Exhibit 24: US CMBS Rating Transition Trends**

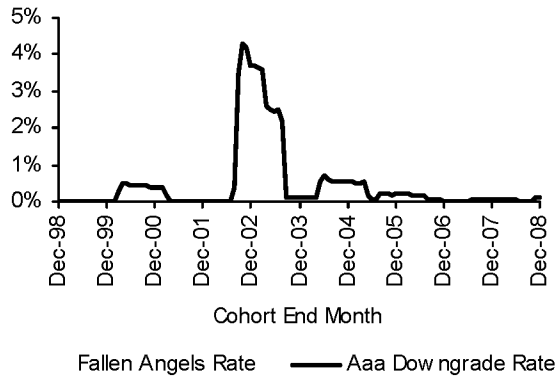
**Exhibit 24A: Upgrade and Downgrade Rates**



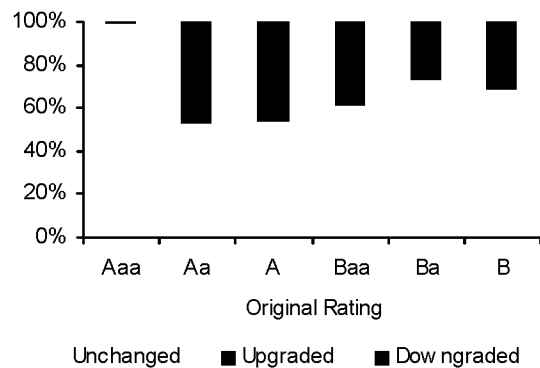
**Exhibit 24B: Average Number of Notches Upgraded or Downgraded**



**Exhibit 24C: Fallen Angel Rates and Aaa Downgrade Rates**



**Exhibit 24D: Cumulative Upgrade and Downgrade Rates by Original Rating**



**Exhibit 24E: Summary of Rating Transition Trends**

|  | 2008   | 2007   | 1999-2008 | 1999-2007 |
|--|--------|--------|-----------|-----------|
| Downgrade Rate                           | 4.28%  | 0.80%  | 2.57%     | 2.69%     |
| Upgrade Rate                             | 4.68%  | 10.19% | 9.21%     | 9.96%     |
| Downgrade/Upgrade Ratio                  | 0.91   | 0.08   | 0.28      | 0.27      |
| Downgrade Rate (Notch Weighted)          | 9.77%  | 1.59%  | 5.58%     | 5.96%     |
| Upgrade Rate (Notch Weighted)            | 8.62%  | 23.49% | 21.92%    | 24.14%    |
| Downgrade/Upgrade Ratio (Notch Weighted) | 1.13   | 0.07   | 0.25      | 0.25      |
| Rating Drift (Notch Weighted)            | -1.15% | 21.90% | 16.35%    | 18.18%    |
| Rating Volatility (Notch Weighted)       | 18.39% | 25.08% | 27.50%    | 30.10%    |
| Stability Rate                           | 91.03% | 89.01% | 88.23%    | 87.35%    |
| Average Number of Notches Downgraded     | 2.28   | 2.00   | 2.17      | 2.21      |
| Average Number of Notches Upgraded       | 1.84   | 2.30   | 2.38      | 2.42      |

**US CDOs**

2008 marked a peak year in rating changes for US CDOs. The ongoing credit crisis - along with increased market volatility, limited near-term opportunities for consumers and corporates to refinance debt, and the increasingly negative credit outlook for the global economy - all contributed to the weakening performance of

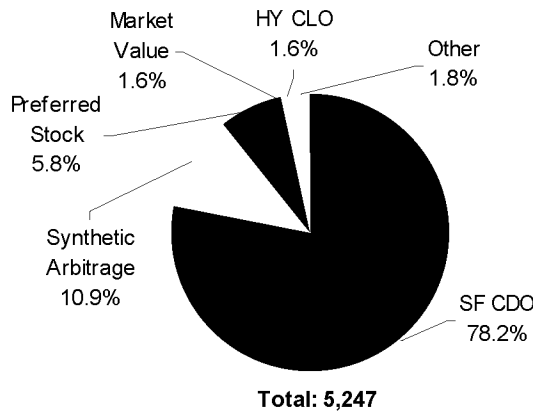
the CDO sector.<sup>11</sup> Overall, 5,345 securities from 1,451 transactions were downgraded and 70 tranches from 30 transactions were upgraded throughout the year.

The vast majority of downgrades occurred among SF CDOs (96%), also known as ABS CDOs. Downgrades also affected asset classes such as synthetic-arbitrage (11%), preferred stock (6%), market value (1.6%) and high-yield CLOs (1.6%) (Exhibit 25A). Almost 80% of the negatively affected securities were issued between 2005 and 2007. The primary reasons for the lowered ratings were the deteriorating credit quality of underlying assets, distress among various corporate and banking entities and heightened spread widening and volatility. Also, about 1.8% of the downgrades were related to financial guarantor downgrades.

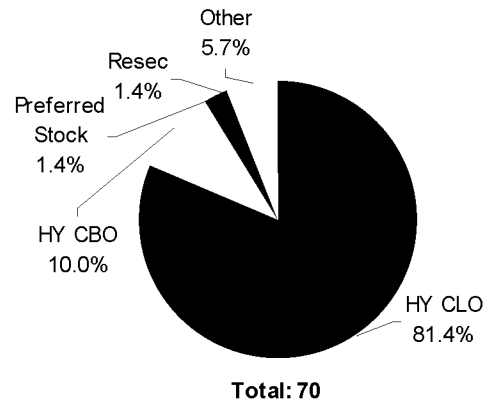
Upgrades (Exhibit 25B) were concentrated in HY CLOs (81%) and followed by HY CBOs (10%), preferred stock (1.4%) and SF CDOs (1.4%). Most of the upgrades in the CLOs and CBOs were due to amortizing of senior tranches and de-levering of the transactions.

**Exhibit 25: Distribution of US CDO Rating Changes in 2008**

**Exhibit 25A: Downgrades by Deal Type**



**Exhibit 25B: Upgrades by Deal Type**

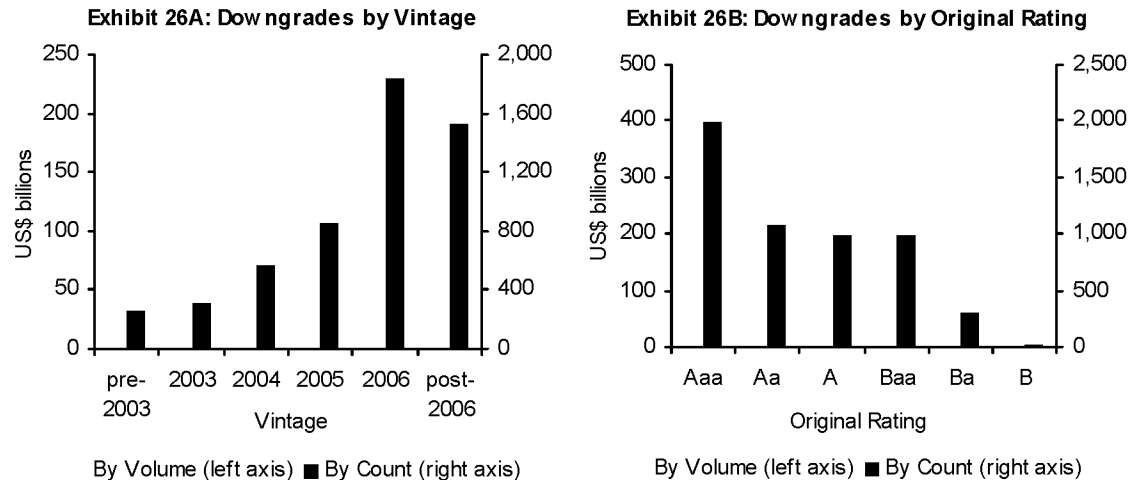


<sup>11</sup> See, "Structured Finance CDO Ratings Surveillance Brief - Fourth Quarter 2008", dated January 27, 2009

Exhibit 26 shows the distribution of downgrades by vintage and original rating. By vintage (Exhibit 26A), securities that were issued after 2005 made up roughly two-thirds of the downgrades, both by count and by volume, tracking the weak performance of residential mortgage-backed securities of recent vintages that were associated with the downgraded CDO transactions.

By original rating (Exhibit 26B), initially rated Aaa tranches made up the largest share of all downgrades by count (37%) and by volume (79%). The number of downgrades securities in the Aa, A and Baa rating categories was almost evenly distributed with each making up 18-20% of all downgrades.

### Exhibit 26: US CDO Downgrades in 2008



For the US CDO sector in 2008 (see Exhibit 27):

The 12-month downgrade rate rose to an all-time high of 48%, almost a 6-fold increase over the prior rate of 8.4% and 3.5 times higher than the historical average of 14%. At the same time, the upgrade rate declined to 0.64%, half of the 2007 and historical average rate of 1.3%.

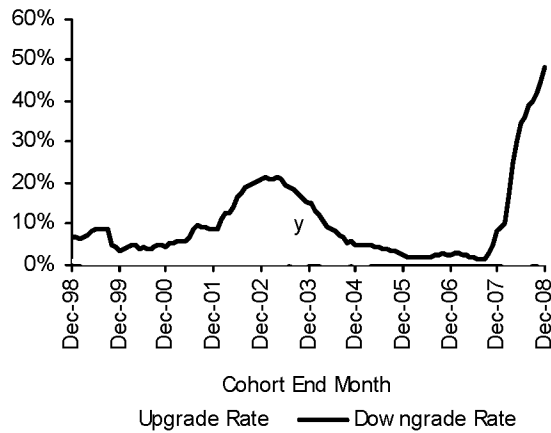
The average downgrade severity increased to almost 10 notches, roughly 3 notches above the 2007 average, while the average magnitude of upgrades fell slightly from 3 notches in 2007 to 2.7 notches in 2008.

The fallen angel and Aaa downgrade rates increased to 35% and 47%, respectively.

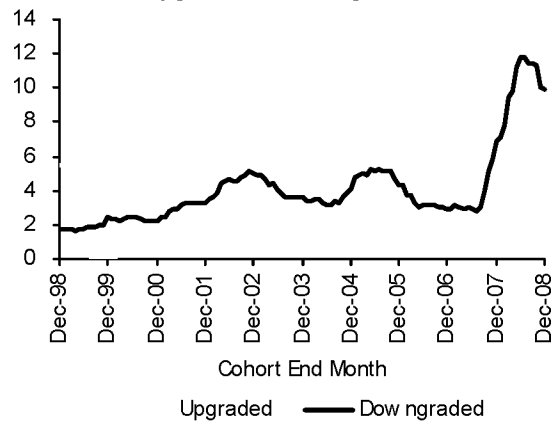
As of the end of 2008, securities that were first rated Aa, Baa and B saw cumulative downgrade rates that were slightly higher (50% each) than the rates exhibited by originally rated Aaa and A securities. Securities in the Ba rating category enjoyed the highest stability rate (61%).

**Exhibit 27: US CDO Rating Transition Trends**

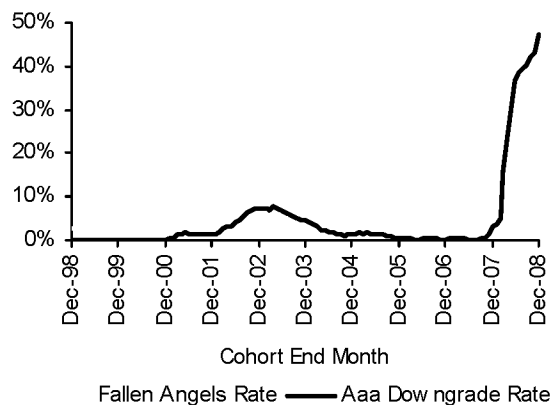
**Exhibit 27A: Upgrade and Downgrade Rates**



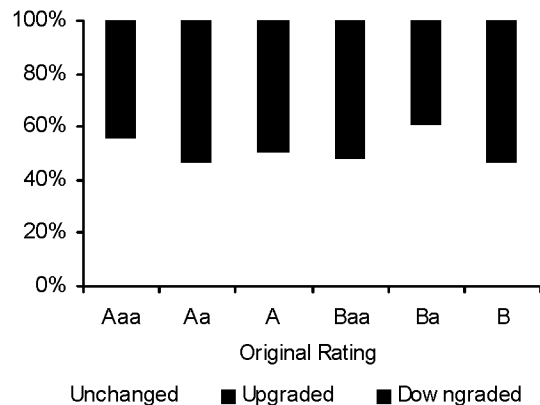
**Exhibit 27B: Average Number of Notches Upgraded or Downgraded**



**Exhibit 27C: Fallen Angel Rates and Aaa Downgrade Rates**



**Exhibit 27D: Cumulative Upgrade and Downgrade Rates by Original Rating**



**Exhibit 27E: Summary of Rating Transition Trends**

|  | 2008     | 2007    | 1999-2008 | 1999-2007 |
|--|----------|---------|-----------|-----------|
| Downgrade Rate                           | 48.34%   | 8.35%   | 13.90%    | 6.57%     |
| Upgrade Rate                             | 0.64%    | 1.29%   | 1.26%     | 1.54%     |
| Downgrade/Upgrade Ratio                  | 75.66    | 6.48    | 11.03     | 4.27      |
| Downgrade Rate (Notch Weighted)          | 479.65%  | 57.13%  | 118.24%   | 26.93%    |
| Upgrade Rate (Notch Weighted)            | 1.73%    | 3.89%   | 4.17%     | 5.22%     |
| Downgrade/Upgrade Ratio (Notch Weighted) | 278.05   | 14.69   | 28.33     | 5.16      |
| Rating Drift (Notch Weighted)            | -477.93% | -53.24% | -114.06%  | -21.71%   |
| Rating Volatility (Notch Weighted)       | 481.38%  | 61.02%  | 122.41%   | 32.15%    |
| Stability Rate                           | 51.02%   | 90.37%  | 84.84%    | 91.89%    |
| Average Number of Notches Downgraded     | 9.92     | 6.85    | 8.50      | 4.10      |
| Average Number of Notches Upgraded       | 2.70     | 3.02    | 3.31      | 3.39      |

Looking at upgrade and downgrade rates by deal type (Exhibit 28), downgrade rates of SF CDOs, preferred stock and MV CDOs set new highs in December 2008, reaching peaks of 91%, 55% and 34% respectively (Exhibits 28A and 28B). The frequency of downgrades among synthetic arbitrage securities also reached a peak in December 2008 (60%). At the same time, upgrade activity was rare and included a few upgrades

among SF CDOs, one upgrade among preferred stock CDOs and absolutely no upgrade activity for synthetic arbitrage and MV CDOs (Exhibit 28C and 28D).

Downgrade rates among high-yield CBOs (5.9%), investment-grade CBOs (8%), high-yield CLOs (2.5%) and SME CDOs (4.3%) rose slightly in December 2008 over their respective 2007 levels but remained relatively low (Exhibit 28A and 28B). Although the upgrade rate of HY CLOs more than doubled over the prior year level (1.7% vs. 0.6%), upgrades were still less frequent than downgrades. HY CBOs and IG CBOs experienced a decline in the frequency of upgrades and SME CDOs saw no upgrades for the first time since the cohort ending June 2005 (Exhibit 28C and 28D).

In addition, Moody's updated key assumptions with respect to probability of default and asset correlation for rating corporate synthetic CDOs in January 2009.<sup>12</sup> This should result in additional downgrades.

**Exhibit 28: 12-month Transition Rates for Select US CDO Deal Types**

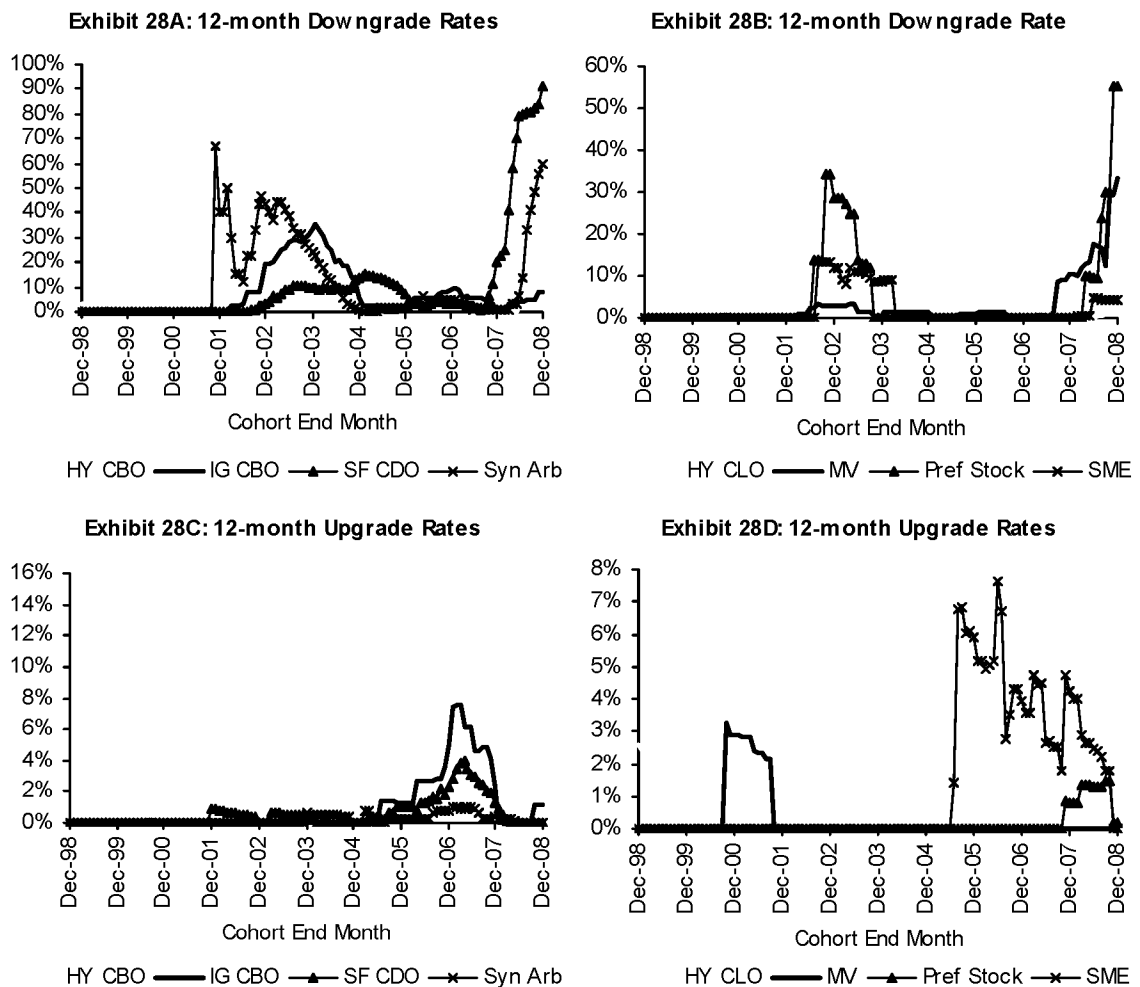


Exhibit 29 shows the cumulative transition matrices for all SF CDOs outstanding and SF CDOs of 2006 and 2007 vintages. For the year ending December 2008, SF CDOs registered an unusually high number of downgrades and a rating stability in the teens or below across all rating categories. The Aaa rating category, on average, has roughly 54% of its ratings transition into the Caa and below rating category, but the 2006 and 2007 vintages performed much worse with 75% and 86% of their original Aaa securities transitioning to Caa and below, respectively.

<sup>12</sup> See, "Moody's updates key assumptions for rating corporate synthetic CDOs", dated January 15, 2009.

**Exhibit 29A: Rating Transition Matrix for All US SF CDOs by Original Rating**

Rating as of 12/31/08

| Orig Rtg | Aaa            | Aa            | A             | Baa           | Ba            | B            | Caa          | Ca             | C              |
|----------|----------------|---------------|---------------|---------------|---------------|--------------|--------------|----------------|----------------|
| Aaa      | 13.8%<br>(268) | 8.6%<br>(166) | 5%<br>(97)    | 5.5%<br>(107) | 5.6%<br>(108) | 8%<br>(156)  | 14%<br>(271) | 20.9%<br>(405) | 18.7%<br>(363) |
| Aa       | 0.3%<br>(3)    | 8.1%<br>(73)  | 9.4%<br>(84)  | 4.1%<br>(37)  | 3.2%<br>(29)  | 4.8%<br>(43) | 12%<br>(108) | 29.8%<br>(267) | 28.2%<br>(253) |
| A        |                | 2.3%<br>(18)  | 11.4%<br>(91) | 6.6%<br>(53)  | 1.5%<br>(12)  | 2.3%<br>(18) | 6.9%<br>(55) | 19%<br>(152)   | 50.1%<br>(401) |
| Baa      |                | 0.1%<br>(1)   | 0.8%<br>(7)   | 7.2%<br>(66)  | 4.4%<br>(40)  | 3.4%<br>(31) | 5.8%<br>(53) | 16%<br>(146)   | 62.4%<br>(570) |
| Ba       |                |               | 0.4%<br>(1)   | 2.2%<br>(6)   | 5.8%<br>(16)  | 6.8%<br>(19) | 1.4%<br>(4)  | 12.2%<br>(34)  | 71.2%<br>(198) |
| B        |                |               |               |               | 16.7%<br>(1)  | 16.7%<br>(1) |              | 16.7%<br>(1)   | 50%<br>(3)     |

**Exhibit 29B: Rating Transition Matrix for 2006-Vintage US SF CDOs by Original Rating**

Rating as of 12/31/08

| Orig Rtg | Aaa          | Aa          | A           | Baa          | Ba           | B            | Caa            | Ca             | C              |
|----------|--------------|-------------|-------------|--------------|--------------|--------------|----------------|----------------|----------------|
| Aaa      | 5.2%<br>(30) | 3%<br>(17)  | 1.2%<br>(7) | 1.7%<br>(10) | 5.2%<br>(30) | 8.5%<br>(49) | 21.4%<br>(123) | 30.6%<br>(176) | 23.3%<br>(134) |
| Aa       |              | 1.9%<br>(6) | 2.8%<br>(9) | 2.8%<br>(9)  | 1.6%<br>(5)  | 2.5%<br>(8)  | 11%<br>(35)    | 41%<br>(130)   | 36.3%<br>(115) |
| A        |              |             | 0.7%<br>(2) | 3.2%<br>(9)  | 0.4%<br>(1)  | 0.4%<br>(1)  | 7%<br>(20)     | 23.9%<br>(68)  | 64.4%<br>(183) |
| Baa      |              |             |             | 0.4%<br>(1)  | 1.1%<br>(3)  | 1.1%<br>(3)  | 2.9%<br>(8)    | 16.4%<br>(45)  | 78.2%<br>(215) |
| Ba       |              |             |             |              | 0.9%<br>(1)  | 0.9%<br>(1)  |                | 5.6%<br>(6)    | 92.6%<br>(100) |
| B        |              |             |             |              |              |              |                |                | 100%<br>(2)    |

**Exhibit 29C: Rating Transition Matrix for 2007-Vintage US SF CDOs by Original Rating**

Rating as of 12/31/08

| Orig Rtg | Aaa          | Aa           | A             | Baa         | Ba           | B            | Caa           | Ca             | C              |
|----------|--------------|--------------|---------------|-------------|--------------|--------------|---------------|----------------|----------------|
| Aaa      | 2.3%<br>(13) | 2.5%<br>(14) | 0.9%<br>(5)   | 1.4%<br>(8) | 2.5%<br>(14) | 4.9%<br>(28) | 11.6%<br>(66) | 34.6%<br>(197) | 39.5%<br>(225) |
| Aa       |              | 1.4%<br>(3)  | 3.7%<br>(8)   | 0.5%<br>(1) |              |              | 7%<br>(15)    | 29.4%<br>(63)  | 57.9%<br>(124) |
| A        |              |              | 12.1%<br>(27) | 2.7%<br>(6) |              | 0.4%<br>(1)  | 2.7%<br>(6)   | 16.1%<br>(36)  | 65.9%<br>(147) |
| Baa      |              |              |               |             | 2.6%<br>(6)  |              | 0.9%<br>(2)   | 12.2%<br>(28)  | 84.3%<br>(193) |
| Ba       |              |              |               |             | 1.6%<br>(1)  | 4.9%<br>(3)  |               | 13.1%<br>(8)   | 80.3%<br>(49)  |
| B        |              |              |               |             |              |              |               | 100%<br>(1)    |                |

## Other Structured Finance

The other structured finance category contains a diverse group of asset types outside of the four major sectors (ABS, RMBS, CMBS, and CDOs), including asset-backed commercial paper (ABCP), structured covered bonds, insurance-linked securities such as catastrophe bonds, structured investment vehicles (SIVs), and derivative product companies (DPCs) both in the US and EMEA region.<sup>13</sup> Prior to 2007, the performance of this sector had been excellent with very few downgrades and a scattering of upgrades. All that changed in the post-2006 era. In 2008, the turmoil in the credit markets resulted in 101 downgrades and one lone upgrade in this asset category.

In summary for 2008:

**ABCP:** 24 notes from 20 ABCP programs were downgraded. All rating actions were caused by downgrades of counterparties or monoline insurers providing credit or liquidity support to the programs.

**Structured Covered Bonds:** one covered bond upgrade and six covered bond downgrades all in the EMEA region were related to the upgrades and downgrades of the issuers associated with these transactions. The reason these transactions cannot be de-linked from their issuers is the refinancing risk that is inherent in these structures. The downgrades were linked to issuers such as Bradford & Bingley, CCM, FHB Mortgage Bank Co. Plc, Glitner Bank, Irish Nationwide Building Society and Kaupthing Bank. The lone upgrade was related to the upgrade of Irish Life and Permanent Plc.

**DPCs:** 21 ratings were downgraded as a result of significant deterioration in the credit quality of the underlying/reference portfolio due to credit exposure to ABS CDOs, Lehman Brothers Holdings Inc. (filed for protection under Chapter 11 of the U.S. Bankruptcy Code on September 15, 2008), Washington Mutual Inc. (filed for Chapter 11 on September 26, 2008), or Fannie Mae and Freddie Mac (placed into the conservatorship of the U.S. government on September 8, 2008). In addition, the financial subsidiaries or DPCs associated with these transactions were themselves downgraded as a result of bankruptcy or downgrade of the parent company and the stressed market conditions.

**Insurance Linked Notes:** nine ratings were downgraded as result of downgrades of the monoline insurers securing these transactions.

**SIVs:**<sup>14</sup> Nearly all SIVs have suffered some negative rating action, but the magnitude has varied from vehicle to vehicle depending on leverage, liquidity gap, asset pricing/composition and restructuring factors. By the end of 2008, 41 ratings from 25 programs had been downgraded and more remain on review for downgrade in 2009 as managers explore their options in the current difficult environment. The main rationale behind the negative rating actions is the deterioration of SIV portfolio market values, the inability of SIVs to issue new debt or refinance maturing debt. In Europe, which accounted for 85% of all SIV downgrades, the significant declines in portfolio market value left the majority of the senior debt ratings in these vehicles fully dependent on the performance of the bank/insurer to meet its obligations. Hence the downgrade was a result of either aligning the ratings of the SIV with the sponsoring entity or in some cases the result of a bank/insurer downgrade directly.

The cumulative transition matrix for SIVs by original rating is presented in Exhibit 30. It should be noted that prior to 2007, no SIV had ever experienced a downgrade. However, now that downgrades have occurred, they have affected all rating categories. For the mezzanine and capital notes (those rated below Aaa), at least 75% have been downgraded in every rating category, usually to Caa and below. For the medium term note programs and senior notes (those rated Aaa), close to 70% have been downgraded, in some cases to below investment-grade.

<sup>13</sup> This study only covers long-term ratings issued under these programs. A short-term rating transition study is forthcoming.

<sup>14</sup> Moody's has published a number of recent reports on SIVs. For example, see "FAQs Regarding Current State of the Structured Investment Vehicle (SIV) Market," *Moody's Special Report*, January 15, 2008 and "Moody's Update on Structured Investment Vehicles," *Moody's Special Report*, January 16, 2008.



**Exhibit 30: Global SIV Rating Transitions by Original Rating as of 12/31/08**

| Orig Rtg | Total | Current Rating/Last Rating before WR |        |        |       |       |        |               |
|----------|-------|--------------------------------------|--------|--------|-------|-------|--------|---------------|
|          |       | Aaa                                  | Aa     | A      | Baa   | Ba    | B      | Caa and below |
| Aaa      | 35    | 31.43%                               | 25.71% | 8.57%  |       |       | 20.00% | 14.29%        |
| Aa       | 4     |                                      | 25.00% |        |       |       |        | 75.00%        |
| A        | 8     |                                      |        | 12.50% |       |       |        | 87.50%        |
| Baa      | 18    |                                      |        |        | 5.56% | 5.56% |        | 88.89%        |

Note: Each unique program within the SIV (i.e. each program with the same rating) is counted once, regardless of how many securities are issued out of the program.

**Regional Comparisons of Rating Transitions****EMEA and US Rating Transitions<sup>15</sup>**

The lack of subprime mortgage securitizations in the EMEA region did not prevent the global credit crisis from reaching its shores. All told, 1866 ratings from 678 deals were downgraded and 90 ratings from 33 deals were upgraded during the year. CDOs led both downgrade (72.9%) and upgrade (65.6%) activity. The second largest source of upgrades was ABS (15.6%), followed by CMBS (12.2%), RMBS (5.6%) and one covered bond (1.1%). The downgrade activity was concentrated in RMBS (11.8%), followed by ABS (9.8%), and CMBS (3%). The other structured finance category, namely EMEA SIVs, ABCP, DPCs and covered bonds accounted for the remaining 2.5% of downgrade activity.

Historically the 12-month downgrade rates for EMEA and the US have tracked each other closely. While Europe experienced a 6-fold increase in its 2008 downgrade rate (19.1%) compared to 2007 (2.7%), the US experienced a 3.7-fold increase over the same period (from 8.1% in 2007 to 38% in 2008) (Exhibit 31). The average magnitude of rating downgrades also remains highly correlated between the regions, with EMEA averaging downgrades of 8.05 notches compared to the US average of 8.34 notches in 2008. Similarly, the size of both EMEA and US upgrades was around 2 notches for the cohort ending December 2008.

Nine percent of the overall downgrade activity was due to downgrades of the financial guarantors. However, in some sectors like ABS<sup>16</sup> and CMBS,<sup>17</sup> financial guarantor related downgrades accounted for up to 64% of all downgrades and RMBS accounted for the remaining 8% of the financial guarantor related downgrades. The remaining downgrades (66 in ABS, 1357 in CDOs, 20 in CMBS, 204 in RMBS and 46 in Other) were the result of several interconnected factors such as declining property values and a stressed macro environment. Poor portfolio performance was seen across asset classes. Lehman's bankruptcy and downgrades of AIG and several banks exacerbated various counterparty risks at the same time net asset values were falling, spreads were widening, and refinancing risk was increasing. Even the foreign exchange markets were not spared, seeing significant currency fluctuations which increased redenomination risk especially of ruble denominated ABS portfolios and between the USD and local emerging markets' referenced CDO portfolios.

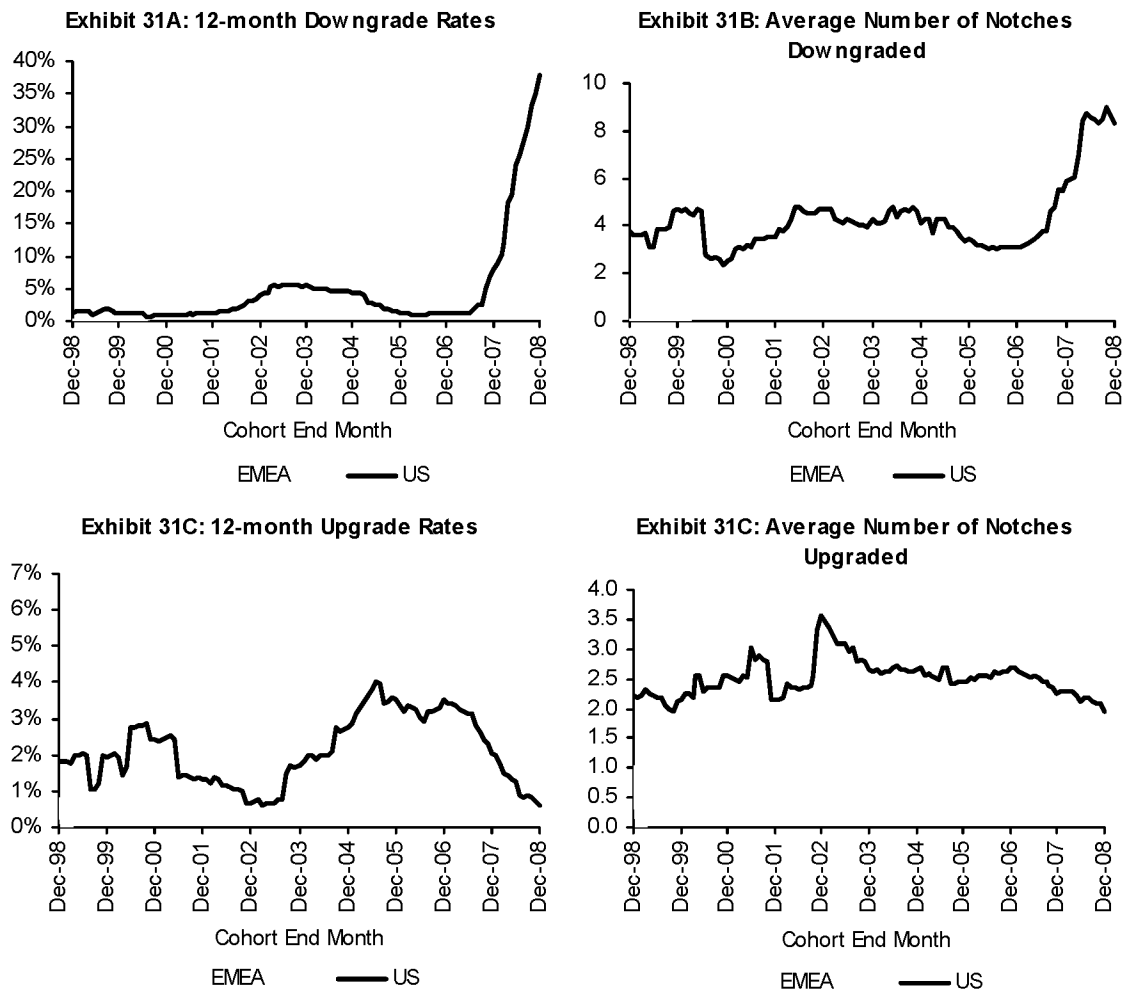
The CDO sector benefited from the bulk (59 of 90) of the upgrades in the EMEA region. ABS, CMBS, RMBS and OtherSF sectors each accounted for 14, 59, 11, 5 and one upgrades respectively. The upgrades were largely the result of better than expected collateral performance, de-leveraging of the structures arising from amortization of the portfolio, positive credit migration in the underlying pools, increase in the level of credit enhancement, and in Covered Bonds the upgrade of the issuer Irish Life and Permanent.

<sup>15</sup> A separate study for EMEA structured finance rating transitions is forthcoming.

<sup>16</sup> See, "EMEA Asset-Backed Securities and Residential Mortgage-Backed Securities: 2008 Review and 2009 Outlook", January 19, 2009.

<sup>17</sup> See, "2008 Review and 2009 Outlook EMEA CMBS: Limited primary issuance and credit market turmoil affecting transaction performance", January 29, 2009.

### Exhibit 31: Comparison of Rating Transition Trends for EMEA and US Structured Finance



#### Exhibit 31E : Summary of Rating Transition Trends

|  | EMEA     |        |           | US       |         |           |
|--|----------|--------|-----------|----------|---------|-----------|
|  | 2008     | 2007   | 1999-2008 | 2008     | 2007    | 1999-2008 |
| Downgrade Rate                           | 19.10%   | 2.69%  | 4.46%     | 37.97%   | 8.10%   | 7.85%     |
| Upgrade Rate                             | 0.94%    | 3.00%  | 2.83%     | 0.61%    | 2.03%   | 2.17%     |
| Downgrade/Upgrade Ratio                  | 20.38    | 0.89   | 1.57      | 62.67    | 3.98    | 3.62      |
| Downgrade Rate (Notch Weighted)          | 153.71%  | 8.72%  | 24.07%    | 316.65%  | 47.41%  | 57.35%    |
| Upgrade Rate (Notch Weighted)            | 2.23%    | 6.43%  | 5.82%     | 1.19%    | 4.61%   | 5.44%     |
| Downgrade/Upgrade Ratio (Notch Weighted) | 68.96    | 1.35   | 4.14      | 266.59   | 10.29   | 10.55     |
| Rating Drift (Notch Weighted)            | -151.48% | -2.28% | -18.25%   | -315.46% | -42.80% | -51.92%   |
| Rating Volatility (Notch Weighted)       | 155.94%  | 15.15% | 29.89%    | 317.84%  | 52.02%  | 62.79%    |
| Stability Rate                           | 79.96%   | 94.31% | 92.71%    | 61.43%   | 89.87%  | 89.98%    |
| Average Number of Notches Downgraded     | 8.05     | 3.24   | 5.40      | 8.34     | 5.85    | 7.31      |
| Average Number of Notches Upgraded       | 2.38     | 2.14   | 2.05      | 1.96     | 2.27    | 2.51      |

Exhibit 32 compares the US and EMEA 12-month rating transition matrix for 2008. The US experienced much higher transitions to the Caa and below category across the capital structure (except for the Aaa rating category). All rating categories were more stable in the EMEA zone, with at least 75% of the ratings remaining unchanged compared to about 50% in the US (73% for Aaa).

### Exhibit 32: EMEA and US Structured Finance 12-month Rating Transition Matrices for 2008

| EMEA in 2008  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below |
|---------------|--------|--------|--------|--------|--------|--------|---------------|
| Aaa           | 82.63% | 6.24%  | 2.52%  | 2.68%  | 1.29%  | 1.34%  | 3.31%         |
| Aa            | 1.14%  | 75.17% | 6.36%  | 2.44%  | 3.07%  | 3.47%  | 8.35%         |
| A             | 0.29%  | 0.94%  | 79.87% | 5.46%  | 1.76%  | 1.88%  | 9.80%         |
| Baa           | 0.06%  |        | 0.84%  | 84.83% | 6.26%  | 2.58%  | 5.42%         |
| Ba            | 0.33%  |        |        | 1.49%  | 83.31% | 7.27%  | 7.60%         |
| B             |        |        |        |        | 4.69%  | 78.13% | 17.19%        |
| Caa and below |        |        |        |        |        |        | 100.00%       |
| US in 2008    | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below |
| Aaa           | 72.59% | 7.50%  | 6.76%  | 5.61%  | 3.04%  | 1.82%  | 2.68%         |
| Aa            | 0.92%  | 51.37% | 7.66%  | 6.29%  | 5.24%  | 8.90%  | 19.62%        |
| A             | 0.19%  | 0.83%  | 54.33% | 8.30%  | 5.42%  | 7.34%  | 23.60%        |
| Baa           | 0.02%  | 0.06%  | 0.77%  | 50.08% | 5.41%  | 6.97%  | 36.69%        |
| Ba            | 0.02%  |        | 0.06%  | 0.55%  | 49.90% | 3.41%  | 46.06%        |
| B             |        |        |        | 0.09%  | 0.09%  | 44.30% | 55.51%        |
| Caa and below |        |        |        |        |        | 0.14%  | 99.86%        |

### Asia-Pacific and US Rating Transitions<sup>18</sup>

The Asia-Pacific structured finance downgrade rate increased to 6.3% in July 2008 after staying flat around 1% for the past 8 years. During the year, 185 ratings from 158 deals were downgraded and 62 ratings from 37 deals were upgraded.

Of the 185 downgrades, 113 occurred in RMBS, 37 in CDOs, 20 in CMBS and 15 in ABS. In ABS, 40% of the downgrades were related to monoline downgrades; the remaining two monoline downgrades were in RMBS. Downgrades were dominant in the two largest Asian markets, Japan<sup>19</sup> and Australia.<sup>20</sup> The downgrades were the result of several factors including poor performance in the underlying receivables pool, CDOs referencing obligors in the US and Iceland that experienced negative credit events, liquidation of originator and primary servicers, downgrades of mortgage insurers like PMI Mortgage Insurance Ltd., Genworth and AIG, concerns about refinancing of the loans and/or uncertainty about collateral recovery. In addition, in Japan, downgrades in ABS were also the result of updates to the real-estate backed SME methodology, and in consumer finance they were the result of revisiting the risk of overpaid interest claims.

Of the 62 upgrades, 30 were in ABS, 16 in CDOs, nine in RMBS and seven in CMBS. Upgrades were the result of better than expected collateral performance and/or build up of credit enhancement relative to originally expected losses.

The structured finance downgrade rates of the Asia-Pacific and the US have been historically uncorrelated. However, in 2008, the Asia-Pacific downgrade rate increased more than 8-fold from 0.9% in 2007 to 7.7% in 2008. The upgrade rate almost halved to 2.6% from 4.6% in 2007 but was significantly better than the 0.6% upgrade rate in the US in 2008. Both the average size of the downgrades (3.1 notches) and upgrades (3.3 notches) indicate that the Asia-Pacific sector experienced the most stable performance compared to any other

<sup>18</sup> This study clubs together all regions in the Asia-Pacific zone including Australia. However, two separate studies focusing on structured finance rating transitions in Japan and in the Asia-Pacific region ex. Japan are forthcoming.

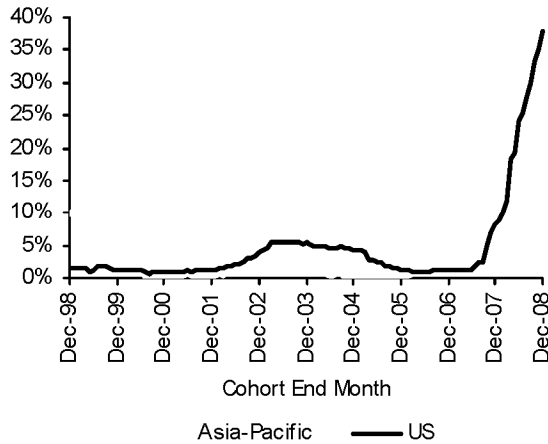
<sup>19</sup> See "2008 Review and 2009 Outlook Japan's Securitization Market", January 23, 2009.

<sup>20</sup> See "2008 Review and 2009 Outlook Australian Structured Finance: Global Financial Crisis Takes Toll, Difficult Year Ahead", February 12, 2009.

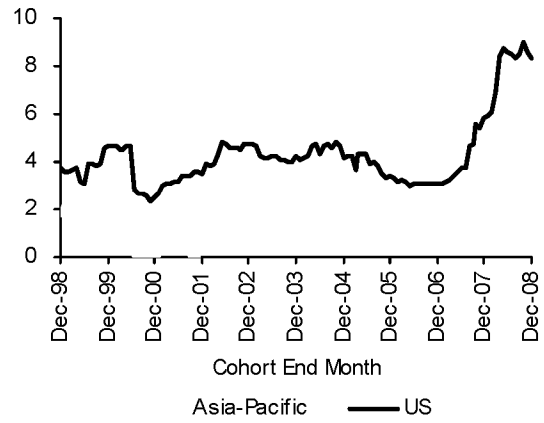
region covered in this report. Most regions mimicked the US average size of downgrades and upgrades of 8.3 notches and 2 notches respectively.

**Exhibit 33: Comparison of Rating Transition Trends for Asia-Pacific and US Structured Finance**

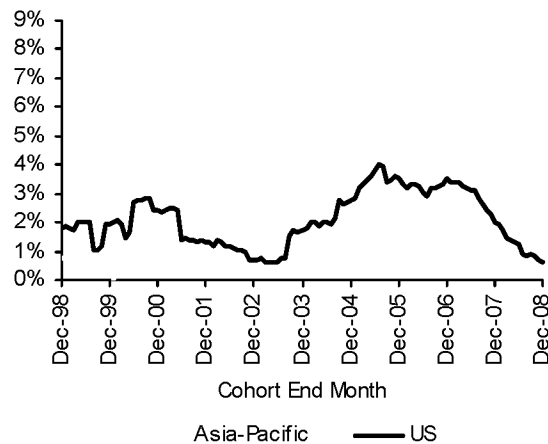
**Exhibit 33A: 12-month Downgrade Rates**



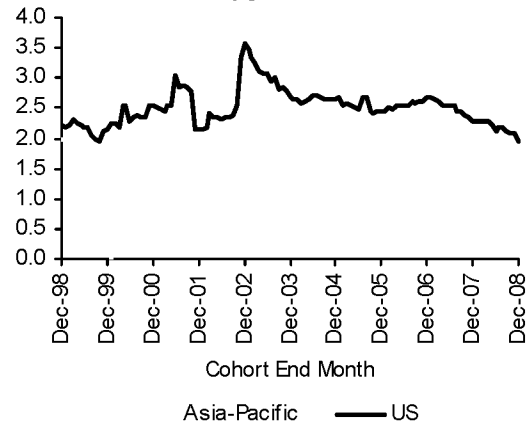
**Exhibit 33B: Average Number of Notches Downgraded**



**Exhibit 33C: 12-month Upgrade Rates**



**Exhibit 33C: Average Number of Notches Upgraded**



**Exhibit 33E: Summary of Rating Transition Trends**

|  | Asia-Pacific |        |           | US       |         |           |
|--|--------------|--------|-----------|----------|---------|-----------|
|  | 2008         | 2007   | 1999-2008 | 2008     | 2007    | 1999-2008 |
| Downgrade Rate                           | 7.74%        | 0.94%  | 1.28%     | 37.97%   | 8.10%   | 7.85%     |
| Upgrade Rate                             | 2.59%        | 4.55%  | 4.14%     | 0.61%    | 2.03%   | 2.17%     |
| Downgrade/Upgrade Ratio                  | 2.98         | 0.21   | 0.31      | 62.67    | 3.98    | 3.62      |
| Downgrade Rate (Notch Weighted)          | 23.95%       | 2.35%  | 3.03%     | 316.65%  | 47.41%  | 57.35%    |
| Upgrade Rate (Notch Weighted)            | 8.55%        | 12.86% | 11.75%    | 1.19%    | 4.61%   | 5.44%     |
| Downgrade/Upgrade Ratio (Notch Weighted) | 2.80         | 0.18   | 0.26      | 266.59   | 10.29   | 10.55     |
| Rating Drift (Notch Weighted)            | -15.40%      | 10.51% | 8.72%     | -315.46% | -42.80% | -51.92%   |
| Rating Volatility (Notch Weighted)       | 32.50%       | 15.20% | 14.79%    | 317.84%  | 52.02%  | 62.79%    |
| Stability Rate                           | 89.66%       | 94.51% | 94.58%    | 61.43%   | 89.87%  | 89.98%    |
| Average Number of Notches Downgraded     | 3.09         | 2.50   | 2.38      | 8.34     | 5.85    | 7.31      |
| Average Number of Notches Upgraded       | 3.30         | 2.82   | 2.84      | 1.96     | 2.27    | 2.51      |

Across all rating categories, Asia-Pacific structured finance securities were much more stable than US structured finance securities and experienced very few transitions to Caa and below rating categories in 2008 (Exhibit 34).

**Exhibit 34: Asia-Pacific and US Structured Finance 12-month Rating Transition Matrices for 2008**

| Asia-Pacific in 2008 | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below |
|----------------------|--------|--------|--------|--------|--------|--------|---------------|
| Aaa                  | 99.09% | 0.25%  | 0.25%  | 0.33%  |        |        | 0.08%         |
| Aa                   | 2.77%  | 94.03% | 0.64%  | 1.28%  | 0.21%  |        | 1.07%         |
| A                    | 2.88%  | 3.96%  | 88.49% | 1.44%  | 0.72%  | 0.72%  | 1.80%         |
| Baa                  | 3.57%  |        | 2.38%  | 86.90% | 3.17%  | 1.59%  | 2.38%         |
| Ba                   |        | 0.89%  |        | 0.89%  | 92.86% | 5.36%  |               |
| B                    |        |        |        |        | 3.23%  | 83.87% | 12.90%        |
| Caa and below        |        |        |        |        |        |        | 100.00%       |
| US in 2008           | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below |
| Aaa                  | 72.59% | 7.50%  | 6.76%  | 5.61%  | 3.04%  | 1.82%  | 2.68%         |
| Aa                   | 0.92%  | 51.37% | 7.66%  | 6.29%  | 5.24%  | 8.90%  | 19.62%        |
| A                    | 0.19%  | 0.83%  | 54.33% | 8.30%  | 5.42%  | 7.34%  | 23.60%        |
| Baa                  | 0.02%  | 0.06%  | 0.77%  | 50.08% | 5.41%  | 6.97%  | 36.69%        |
| Ba                   | 0.02%  |        | 0.06%  | 0.55%  | 49.90% | 3.41%  | 46.06%        |
| B                    |        |        |        | 0.09%  | 0.09%  | 44.30% | 55.51%        |
| Caa and below        |        |        |        |        |        | 0.14%  | 99.86%        |

## Latin America and US Rating Transitions

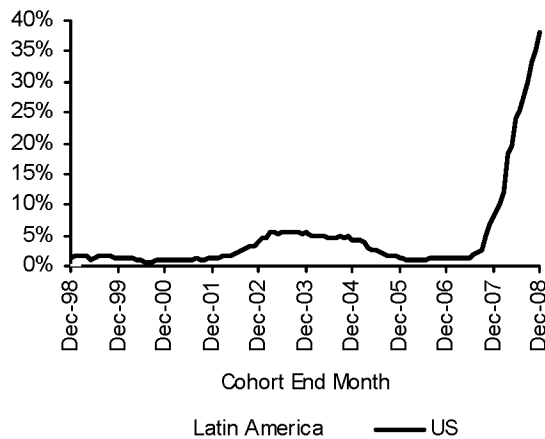
The rating drift was decidedly negative in 2008 compared to 2007 for the Latin American structured finance market. In 2008, the region experienced 48 downgrades from 47 deals and 11 upgrades from 10 deals.

All 21 tranches backed by ABS receivables were downgraded as a result of monoline downgrades which largely affected cross-border and future receivables deal types. Of the 27 downgrades in RMBS, 14 were the result of monoline downgrades and 13 the result of poor portfolio performance and concerns about Metrofinanciera as a servicer. All 10 upgrades in ABS were primarily attributable to upgrades of related third parties and the lone RMBS upgrade was due to an improved loan to value ratio of the collateral.

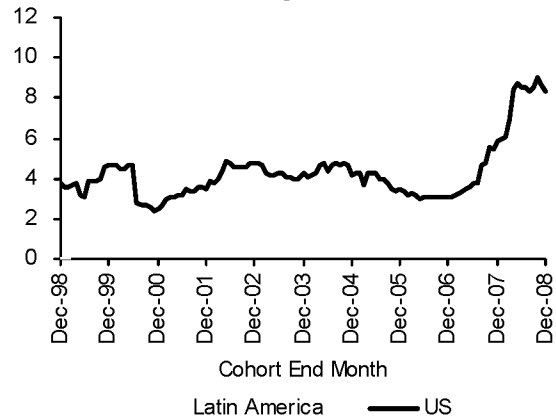
The Latin American 12-month downgrade rate experienced the same trend as the US downgrade rate, increasing from 1% in 2007 to 17.8% in 2008 (Exhibit 35). Similar to the US, the average size of downgrades almost doubled from 4 notches to 7.4 notches. Having reached a historical high of 21.0% in 2006, the upgrade rate dropped to 3.5% in 2008. At the same time, the magnitude of Latin American upgrades also decreased by a notch from 2.3 notches to 1.2 notches.

**Exhibit 35: Comparison of Rating Transition Trends for Latin America and US Structured Finance**

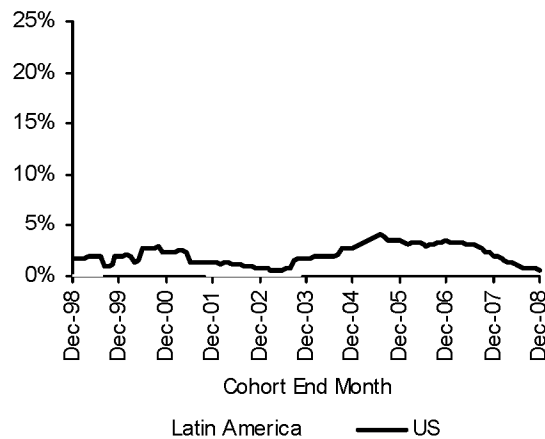
**Exhibit 35A: 12-month Downgrade Rates**



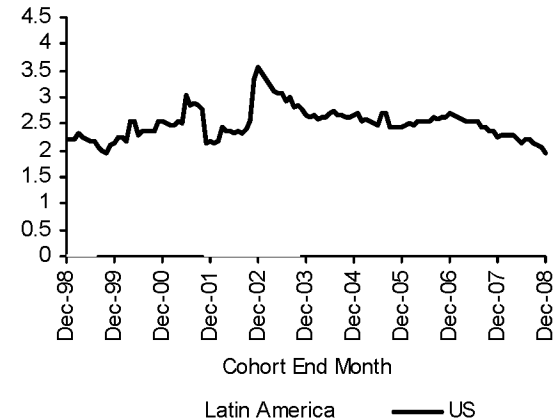
**Exhibit 35B: Average Number of Notches Downgraded**



**Exhibit 35C: 12-month Upgrade Rates**



**Exhibit 35D: Average Number of Notches Upgraded**



**Exhibit 35E: Summary of Rating Transition Trends**

|  | Latin America |        |           | US       |         |           |
|--|---------------|--------|-----------|----------|---------|-----------|
|  | 2008          | 2007   | 1999-2008 | 2008     | 2007    | 1999-2008 |
| Downgrade Rate                           | 17.83%        | 0.95%  | 7.85%     | 37.97%   | 8.10%   | 7.85%     |
| Upgrade Rate                             | 3.49%         | 13.33% | 7.17%     | 0.61%    | 2.03%   | 2.17%     |
| Downgrade/Upgrade Ratio                  | 5.11          | 0.07   | 1.09      | 62.67    | 3.98    | 3.62      |
| Downgrade Rate (Notch Weighted)          | 131.78%       | 3.81%  | 35.48%    | 316.65%  | 47.41%  | 57.35%    |
| Upgrade Rate (Notch Weighted)            | 4.26%         | 30.00% | 15.56%    | 1.19%    | 4.61%   | 5.44%     |
| Downgrade/Upgrade Ratio (Notch Weighted) | 30.91         | 0.13   | 2.28      | 266.59   | 10.29   | 10.55     |
| Rating Drift (Notch Weighted)            | -127.52%      | 26.19% | -19.91%   | -315.46% | -42.80% | -51.92%   |
| Rating Volatility (Notch Weighted)       | 136.05%       | 33.81% | 51.04%    | 317.84%  | 52.02%  | 62.79%    |
| Stability Rate                           | 78.68%        | 85.71% | 84.99%    | 61.43%   | 89.87%  | 89.98%    |
| Average Number of Notches Downgraded     | 7.39          | 4.00   | 4.52      | 8.34     | 5.85    | 7.31      |
| Average Number of Notches Upgraded       | 1.22          | 2.25   | 2.17      | 1.96     | 2.27    | 2.51      |

For the Latin American structured finance market in 2008, all Aaa rated securities experienced a negative migration largely to the Baa broad rating category. The Baa category in turn was the only category to experience migrations to the Caa and below rating category (Exhibit 36). Finally, excluding the Aaa-rated securities, all other rating categories were quite stable compared to the US.

**Exhibit 36: Latin America and US Structured Finance 12-month Rating Transition Matrices for 2008**

| Latin America in 2008 | Aaa    | Aa     | A       | Baa    | Ba     | B       | Caa and below |
|-----------------------|--------|--------|---------|--------|--------|---------|---------------|
| Aaa                   |        | 3.13%  | 28.13%  | 68.75% |        |         |               |
| Aa                    |        |        |         |        |        |         |               |
| A                     |        |        | 100.00% |        |        |         |               |
| Baa                   |        |        | 2.08%   | 83.33% | 5.21%  |         | 9.38%         |
| Ba                    |        |        |         | 1.69%  | 98.31% |         |               |
| B                     |        |        |         |        |        | 100.00% |               |
| Caa and below         |        |        |         |        |        |         | 100.00%       |
| US in 2008            | Aaa    | Aa     | A       | Baa    | Ba     | B       | Caa and below |
| Aaa                   | 72.59% | 7.50%  | 6.76%   | 5.61%  | 3.04%  | 1.82%   | 2.68%         |
| Aa                    | 0.92%  | 51.37% | 7.66%   | 6.29%  | 5.24%  | 8.90%   | 19.62%        |
| A                     | 0.19%  | 0.83%  | 54.33%  | 8.30%  | 5.42%  | 7.34%   | 23.60%        |
| Baa                   | 0.02%  | 0.06%  | 0.77%   | 50.08% | 5.41%  | 6.97%   | 36.69%        |
| Ba                    | 0.02%  |        | 0.06%   | 0.55%  | 49.90% | 3.41%   | 46.06%        |
| B                     |        |        |         | 0.09%  | 0.09%  | 44.30%  | 55.51%        |
| Caa and below         |        |        |         |        |        | 0.14%   | 99.86%        |

## Rating Transitions Among Global Repackaged Securities and Structured Notes

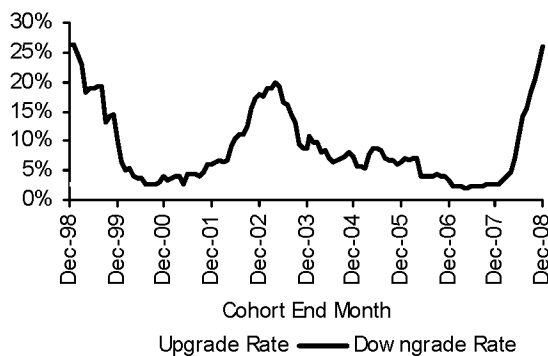
The repackaged securities and structured notes<sup>21</sup> experienced many more negative than positive rating changes in 2008. In total, 485 ratings from 353 deals were downgraded and 195 ratings from 172 deals were upgraded. Since structured notes and repackaged securities made up 61.2% and 36.2%, respectively, of the ratings outstanding at the beginning of the year for this sector, it is not surprising that rating changes were concentrated in these two asset types. Structured notes comprised 70% of downgrades and 60% of upgrades and repackaged securities made up 28% of downgrades and 42% of upgrades. Most rating changes were caused by changes in the rating of the underlying reference credit, while 59 negative rating changes were linked to downgrades of the financial guarantors.

The 12-month downgrade rate in 2008 increased to 25.8%, close to the highs experienced by the sector a decade ago (Exhibit 37). The 12-month upgrade rate stayed around 10.3%, similar to its 2007 level. The average size of rating downgrades (5.4 notches) was almost 3 notches higher than the historical average of 2.3 notches while the average size of the upgrades stayed on par with its historical average of 1.5 notches.

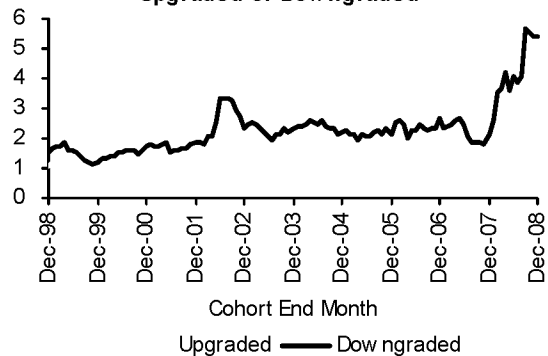
The fallen angel and Aaa downgrade rates increased to 7.6% and 20.9% respectively. Ratings in the derivatives sector have historically experienced substantially more volatility than those in the global structured finance market generally, likely reflecting their closer ties to corporate and sovereign ratings which have also historically experienced comparatively higher migration rates. The Aaa rating category however, experienced a relatively high stability rate (82%).

**Exhibit 37: Global Repacks & Structured Notes Rating Transition Trends**

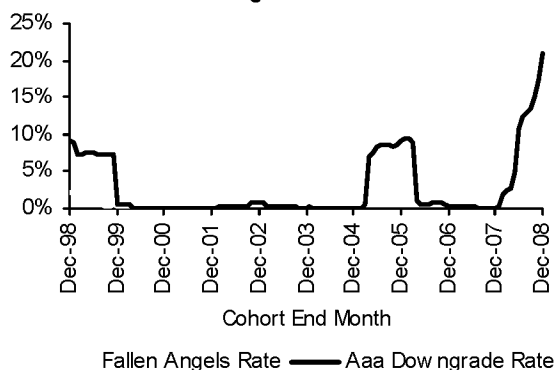
**Exhibit 37A: Upgrade and Downgrade Rates**



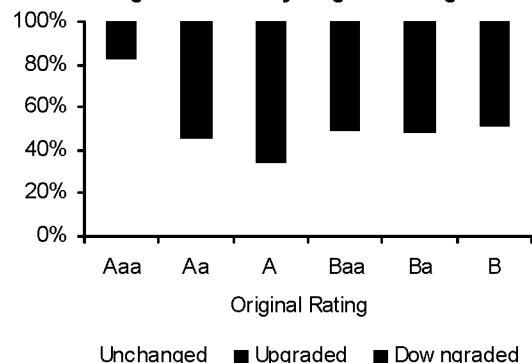
**Exhibit 37B: Average Number of Notches Upgraded or Downgraded**



**Exhibit 37C: Fallen Angel Rates and Aaa Downgrade Rates**



**Exhibit 37D: Cumulative Upgrade and Downgrade Rates by Original Rating**



<sup>21</sup> The composition of the derivatives sector has changed from previous transition studies as some of the asset types that were included in this sector have now been shifted to the "Other Structured Finance" category and are included in the global structured finance statistics. Please see the description of the data sample and glossary in the Appendix for more details.



**Exhibit 37E: Summary of Rating Transition Trends**

|  | 2008     | 2007   | 1999-2008 | 1999-2007 |
|--|----------|--------|-----------|-----------|
| Downgrade Rate                           | 25.80%   | 2.70%  | 7.86%     | 6.93%     |
| Upgrade Rate                             | 10.33%   | 10.38% | 6.07%     | 5.43%     |
| Downgrade/Upgrade Ratio                  | 2.50     | 0.26   | 1.29      | 1.28      |
| Downgrade Rate (Notch Weighted)          | 140.09%  | 5.80%  | 23.21%    | 15.85%    |
| Upgrade Rate (Notch Weighted)            | 15.91%   | 12.90% | 9.03%     | 8.19%     |
| Downgrade/Upgrade Ratio (Notch Weighted) | 8.80     | 0.45   | 2.57      | 1.94      |
| Rating Drift (Notch Weighted)            | -124.18% | 7.09%  | -14.18%   | -7.67%    |
| Rating Volatility (Notch Weighted)       | 156.00%  | 18.70% | 32.23%    | 24.04%    |
| Stability Rate                           | 63.87%   | 86.93% | 86.07%    | 87.65%    |
| Average Number of Notches Downgraded     | 5.43     | 2.15   | 2.95      | 2.29      |
| Average Number of Notches Upgraded       | 1.54     | 1.24   | 1.49      | 1.51      |

Because ratings in the derivatives sector are heavily linked to global corporate and sovereign ratings, it is more appropriate to compare derivative rating transitions with corporate rating transitions. In 2008, derivative ratings performed poorly compared to their corporate counterparts across all rating categories (Exhibit 38). Not only were derivative ratings less stable compared to their corporate counterparts, the derivative sector also experienced several migrations to the Caa and below rating categories.

**Exhibit 38: Comparison of 12-month Rating Transition Matrices between Global Repacks & Structured Notes and Global Corporate Finance for 2008**

| Repacks & Structured Notes in 2008 | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below |
|------------------------------------|--------|--------|--------|--------|--------|--------|---------------|
| Aaa                                | 79.06% | 5.05%  | 6.50%  | 5.60%  | 0.36%  | 1.08%  | 2.35%         |
| Aa                                 |        | 67.66% | 21.89% | 1.24%  | 2.49%  |        | 6.72%         |
| A                                  |        | 17.37% | 68.37% | 6.46%  | 0.22%  | 0.22%  | 7.35%         |
| Baa                                | 0.46%  |        | 1.38%  | 84.33% | 8.76%  |        | 5.07%         |
| Ba                                 |        | 2.67%  |        | 16.00% | 72.00% | 6.67%  | 2.67%         |
| B                                  |        |        |        |        | 10.00% | 70.00% | 20.00%        |
| Caa and below                      |        |        |        |        |        |        | 100.00%       |
| Corporate in 2008                  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa and below |
| Aaa                                | 95.85% | 4.15%  |        |        |        |        |               |
| Aa                                 | 4.43%  | 91.25% | 4.12%  | 0.10%  |        | 0.10%  |               |
| A                                  |        | 10.02% | 87.10% | 2.69%  | 0.06%  |        | 0.13%         |
| Baa                                |        | 0.18%  | 7.30%  | 88.63% | 3.60%  | 0.28%  |               |
| Ba                                 |        |        | 0.18%  | 8.06%  | 83.70% | 7.33%  | 0.73%         |
| B                                  | 0.10%  |        |        | 0.19%  | 6.67%  | 83.60% | 9.44%         |
| Caa and below                      |        |        |        |        |        | 15.12% | 84.88%        |

## Appendix I: Description of Data Sample and Glossary

The data sample used in this report includes all public, 144A, and private tranches with a published Moody's long-term global debt rating among global asset-backed securities (ABS), commercial and residential mortgage-backed securities (CMBS and RMBS), collateralized debt obligations (CDOs), and other structured finance, including asset backed commercial paper (ABCP), structured investment vehicles (SIVs), structured covered bonds, catastrophe bonds, and derivative product companies. Provisional ratings, credit estimates or evaluations, short-term ratings, and national scale ratings are not included. In addition, the following types of securities are excluded from the definition of global structured finance and are analyzed separately in the report: repackaged securities, structured notes, and other credit derivatives which are basically pass-throughs of the rating of another entity.

This data set is an expansion of data sets that were used in annual structured finance transition studies published prior to 2008. In particular, this data sample:

- Includes tranches wrapped by financial guarantors, government agencies, and government sponsored enterprises (GSEs);

- Includes interest-only (IO) and residual tranches;

- Includes some transactions outside of the four major sectors (ABS, CDO, CMBS, RMBS) of structured finance, such as ABCP, SIVs, structured covered bonds, catastrophe bonds and derivative product companies;

- Does not collapse tranches with the same rating from the same deal, i.e. all pari-passu tranches are counted in the data sample. The exceptions to this are notes with the same rating issued out of the same program for ABCP, SIVs and structured covered bonds, in which case only the rating of the program and not each individual security is counted.

The corporate data set used to compare corporate rating transitions to structured finance rating transitions includes international corporate and sovereign issuers, but excludes US municipal ratings.

*The data used to create this report are commercially available via Moody's Structured Finance Default Risk service and Moody's Corporate Default Risk service. For more information, please email [DefaultResearch@moodys.com](mailto:DefaultResearch@moodys.com)*

## Glossary

### Broad Ratings and Refined Ratings

Broad ratings refer to the following Moody's long-term bond rating categories: Aaa, Aa, A, Baa, Ba, B, and Caa and below. Refined ratings or ratings with numeric modifiers refer to Aaa, Aa1, Aa2, Aa3, A1, A2, A3, Baa1, Baa2, Baa3, Ba1, Ba2, Ba3, B1, B2, B3, Caa1, Caa2, Caa3, Ca, and C. The broad rating category Caa and below includes the following refined ratings: Caa1, Caa2, Caa3, Ca, and C.

### Investment-Grade (IG) and Below Investment-Grade (BIG)/Speculative-Grade (SG) Ratings

Investment-grade ratings refer to Aaa, Aa1, Aa2, Aa3, A1, A2, A3, Baa1, Baa2, and Baa3. Below investment-grade or speculative-grade ratings refer to Ba1, Ba2, Ba3, B1, B2, B3, Caa1, Caa2, Caa3, Ca, and C.

### Downgrade (Upgrade) Rate

A security is considered to have been downgraded (upgraded) if its rating at the end of a pre-specified time period is lower (higher) than at the beginning of the time period on the basis of ratings with numeric modifiers (also known as refined ratings or modified ratings). The downgrade (upgrade) rate is the number of securities downgraded (upgraded) divided by the total number of outstanding securities at the beginning of the time period. Note that in measuring downgrade rates and upgrade rates, only ratings at the beginning and the end of the time period are considered. If a rating was withdrawn by the end of the time period, then the rating prior to withdrawal is used as the end rating. Note that a security will only be counted if it was outstanding as of the cohort formation date.

### Average Number of Total Notches Downgraded (Upgraded) per 12-month Cohort

The number of total notches downgraded (upgraded) per 12-month cohort for a downgraded (upgraded) security is the difference in the rating of that security at the beginning and end of a 12-month period based on refined ratings. This term is also referred to as the magnitude, size, or severity of the rating change. The average number of total notches downgraded (upgraded) per 12-month cohort averages this quantity for all downgraded (upgraded) securities over the 12-month period. A security can experience multiple rating actions during a 12-month period, and therefore, this measure is different from the average number of notches changed per rating action. For example, if a security is downgraded from Baa1 to Baa2 and then Baa2 to Baa3 over 12 months, then the average number of notches changed per rating action would be one, but the average number of total notches changed per 12-month cohort would be two.

### Weighted Downgrade (Upgrade) Rate

The weighted downgrade (upgrade) rate is computed as the number of securities downgraded (upgraded), weighted by the number of total notches changed per downgrade (upgrade) per year, divided by the total number of outstanding securities at the beginning of the 12-month period. For example, a security downgraded from Baa1 to B1 over 12 months is counted as three downgrades in the calculation of a weighted downgrade rate, but counted as only one downgrade in the calculation of the unweighted downgrade rate.

### Fallen Angel Rate

A fallen angel is a security that was downgraded from an investment-grade rating to a below investment-grade rating. The fallen angel rate is the number of such securities over a 12-month period divided by the total number of investment grade securities outstanding at the beginning of the 12-month period. Note that a security will only be counted if it was outstanding as of the cohort formation date.

## Cumulative Downgrade (Upgrade) Rate

A security is considered to have experienced a cumulative or lifetime downgrade (upgrade), if its rating before withdrawal or rating at the end of the study period is lower (higher) than its original rating. The cumulative downgrade (upgrade) rate for a particular group of securities is computed as the number of securities to experience a cumulative downgrade (upgrade) divided by the total number of securities in the group

## Downgrade-to-Upgrade Ratio (weighted)

The downgrade-to-upgrade ratio is calculated as the total number of downgraded ratings divided by the total number of upgraded ratings. The weighted downgrade-to-upgrade ratio is the number of downgraded ratings, weighted by the number of notches changed, divided by the number of upgraded ratings, weighted by the number of notches changed.

## Rating Drift

The rating drift is defined as the weighted upgrade rate minus the weighted downgrade rate.

## Rating Volatility

The rating volatility is defined as the weighted upgrade rate plus the weighted downgrade rate.

## Rating Stability Rate

The rating stability rate is a measure of the proportion of ratings that were unchanged over a pre-specified time period. It is calculated as one minus the sum of the downgrade rate and upgrade rate.

## ABS

ABS stand for asset-backed securities. This structured finance sector includes securities backed by home equity loans (HEL) and both traditional asset types such as auto loans, credit card receivables, student loans, and manufactured housing loans, and non-traditional asset types such as mutual fund fees, tax liens, tobacco settlement payments, and intellectual property.

## HEL

The home equity loan or HEL sector includes securities backed by subprime (B&C) mortgage loans, home improvement loans, high loan-to-value (high LTV) loans, home equity lines of credit (HELOCs), and closed-end second-lien loans, as well as net interest margin (NIM) securitizations. It does not include securities backed by Alt-A mortgages, which are included in the RMBS sector. HEL is part of the ABS sector.

Prior to 1998, RMBS collateral was generally defined as first-lien residential mortgages, regardless of the credit quality of the borrower. HEL collateral generally included junior liens such as HELOCs or closed-end seconds. However, as subprime lending became more prevalent, the market shifted its definition such that HEL encompassed subprime first-lien residential mortgages while RMBS included first-lien mortgages made to higher quality borrowers. Since 1998, a deal classified as RMBS by Moody's is generally backed by prime or Alt-A quality first-lien residential mortgages, while a deal classified as HEL is generally backed by subprime first-lien mortgages or junior liens. Therefore, a subprime deal which would be classified as HEL today may have been classified as RMBS in the past.

## CDOs

CDOs stand for collateralized debt obligations. Derivative securities such as structured notes and repackaged securities are not considered to be part of this sector. Commercial real estate (CRE) CDOs, where 70% or more of the collateral is comprised of CRE loans, are classified as CMBS. If the collateral backing the transaction contains less than 70% CRE loans, then the deal is classified as a CDO.

## **CMBS**

CMBS stand for commercial mortgage-backed securities. Commercial real estate (CRE) CDOs, where 70% or more of the collateral is comprised of CRE loans, are classified as CMBS. If the collateral backing the transaction contains less than 70% CRE loans, then the deal is classified as a CDO.

## **RMBS**

RMBS stand for residential mortgage-backed securities. The vast majority of these securities are backed by first-lien prime mortgages or by Alt-A mortgages. For further details, see the definition of HEL.

## **Other Structured Finance**

Other structured finance consists of structured finance securities not categorized in the four major sectors (ABS, CDO, CMBS, and RMBS) including asset-backed commercial paper (ABCP) programs, structured investment vehicles (SIVs), some structured covered bonds, insurance-linked securities such as catastrophe bonds, and derivative product companies. However, notes carrying only short-term ratings such as commercial paper are excluded.

## **Global Structured Finance**

Global structured finance captures securities issued around the world in the four major sectors - ABS, CDO, CMBS, and RMBS – and in the other structured finance category. For further details, see the definition of Other Structured Finance.

## **US Structured Finance**

US structured finance securities are denominated in US dollars and issued in the US market or denominated in Canadian dollars and issued in Canada. In cases where the source of the underlying collateral and the denomination of the securities cross multiple countries/regions, deals are classified by the location at which they are monitored.

## **EMEA Structured Finance**

EMEA is an abbreviation of Europe, the Middle East, and Africa. EMEA structured finance securities are denominated in a currency from or issued out of a country in the EMEA region. In cases where the source of the underlying collateral and the denomination of the securities cross multiple countries/regions, deals are classified by the location at which they are monitored.

## **Asia-Pacific Structured Finance**

Asia-Pacific structured finance securities are denominated in the currency of a country in the Asia-Pacific region or issued in an Asia-Pacific country (including Japan and Australia). In cases where the source of the underlying collateral and the denomination of the securities cross multiple countries/regions, deals are classified by the location at which they are monitored.

## **Latin American Structured Finance**

Latin American structured finance securities are denominated in a Latin American currency or issued in Latin America. In cases where the source of the underlying collateral and the denomination of the securities cross multiple countries/regions, deals are classified by the location at which they are monitored.

## **Global Repacks & Structured Notes**

This sector consists primarily of structured notes, repackaged securities, and other credit derivatives which are basically pass-throughs of the rating of another entity.

## Appendix II: Methodology

### Computation of Rating Transition Statistics

Rating transition statistics can be reported by cohort rating or by original rating. For statistics calculated by cohort rating, every month the rating migrations of all outstanding securities are tracked over a pre-specified time period regardless of when the security was issued. For statistics calculated by original rating, every month the rating migration of all securities issued in that month are tracked over a pre-specified time period, in which case each security carries its original rating at the start of the period.

Unless otherwise stated, transition statistics in the report are calculated by cohort rating and usually the pre-specified time period is one year, although multi-year statistics are also reported. In any case, the rating (including WR) must exist over the entire time period in order to be counted, e.g. a rating must be seasoned at least three years to be counted in a three-year downgrade rate, and only the rating outstanding at the beginning and end of the time period are used.

All average transition statistics (downgrade rates, upgrade rates, transition matrices, etc.) are calculated by averaging over the rates calculated on a monthly basis, where each month's contribution to the total is weighted by the number of ratings used in that month's computation. For example, the average 12-month downgrade rate over 1999 to 2008 is calculated by taking a weighted average of the 12-month downgrade rates of all cohorts in that 10-year period, starting from the cohort ending December 1999 and ending with the cohort ending December 2008.

### Counting Downgrades and Upgrades

Within the main body of the report, a downgrade (upgrade) of a security is counted if its rating at the end of a pre-specified time period or immediately prior to withdrawal, if the rating had been withdrawn during the time period, is lower (higher) than at the beginning of the time period.<sup>22</sup>

Note that if a security is downgraded (upgraded) multiple times over the period under consideration, this will still be counted as one downgrade (upgrade). Moreover, if a tranche is downgraded and then upgraded (or upgraded and then downgraded) so that its start rating and end rating are the same, then no rating change will be considered as having occurred and neither the downgrade nor the upgrade will be counted.

When reporting the absolute number of downgrades (upgrades), all rating changes that occurred during the year under the above definition are counted, regardless of when the rating was issued. In contrast, transition statistics by cohort rating only consider changes to ratings that were outstanding as of the cohort formation date. In particular, if a security was issued in 2007 and downgraded in the same year, then it would not be counted in the 12-month downgrade rate by cohort rating for 2007 because it had not been outstanding as of 1/1/07. This is true of both the transition statistics presented in the main body of the text and the transition matrices in Appendix III.

In addition, the rating transition matrices in Appendix III show the migration to WR rather than the rating just prior to withdrawal. For those who are interested in rating changes prior to withdrawal, some information is provided in the bottom-most transition matrix for the 5-year transition matrices by original rating in Appendix III.

Below is an excerpt from the transition matrix for withdrawn securities for the 5-yr cohort by original rating for global structured finance. The universe of securities under consideration in this row are those that were originally rated Aa, seasoned at least 5 years, and had WR ratings 5 years after issuance. For these tranches, 71.94% were still rated Aa immediately before withdrawal, 21.31% had been upgraded to Aaa, 3.87% had been downgraded to single-A, 1.62% had been downgraded to Baa, etc..

<sup>22</sup> This differs from how withdrawals were treated in annual transition studies published prior to 2008 when rating changes prior to WR were not counted. In the structured finance transition studies published between 2005 and 2007, half the withdrawn ratings were deducted from the population, and in 2003 and 2004, all withdrawn ratings were deducted from the population.

## Sample Row from a Transition Matrix of Ratings prior to WR

| Rating before WR |        |        |       |       |       |       |               |
|------------------|--------|--------|-------|-------|-------|-------|---------------|
| Original Rating  | Aaa    | Aa     | A     | Baa   | Ba    | B     | Caa and below |
| Aa               | 21.31% | 71.94% | 3.87% | 1.62% | 0.23% | 0.18% | 0.86%         |

## Appendix III: Multi-Year Horizon Transition Matrices

### Matrices by Cohort Rating

**Exhibit 39: Global Structured Finance Rating Transition Matrices by Cohort Rating (1984-2008)**

| 1-year        | Aaa   | Aa    | A     | Baa   | Ba    | B     | Caa and below | WR    |
|---------------|-------|-------|-------|-------|-------|-------|---------------|-------|
| Aaa           | 85.2% | 0.7%  | 0.5%  | 0.4%  | 0.2%  | 0.1%  | 0.2%          | 12.7% |
| Aa            | 4.8%  | 80.8% | 2.1%  | 1.1%  | 0.8%  | 1.7%  | 1.7%          | 6.9%  |
| A             | 1.0%  | 3.1%  | 79.4% | 3.3%  | 1.4%  | 2.0%  | 3.2%          | 6.7%  |
| Baa           | 0.3%  | 0.4%  | 2.3%  | 77.9% | 3.4%  | 2.9%  | 6.9%          | 5.9%  |
| Ba            | 0.1%  | 0.1%  | 0.4%  | 2.3%  | 77.2% | 3.5%  | 10.5%         | 5.9%  |
| B             | 0.1%  | 0.0%  | 0.1%  | 0.3%  | 1.7%  | 79.0% | 13.1%         | 5.7%  |
| Caa and below | 0.0%  | 0.0%  | 0.0%  | 0.1%  | 0.1%  | 0.5%  | 89.3%         | 10.0% |
| 2-year        | Aaa   | Aa    | A     | Baa   | Ba    | B     | Caa and below | WR    |
| Aaa           | 71.2% | 0.8%  | 0.5%  | 0.3%  | 0.1%  | 0.1%  | 0.1%          | 27.0% |
| Aa            | 9.6%  | 66.7% | 2.8%  | 1.5%  | 0.7%  | 0.9%  | 1.2%          | 16.7% |
| A             | 2.4%  | 5.5%  | 66.6% | 3.7%  | 1.6%  | 1.4%  | 2.7%          | 16.1% |
| Baa           | 0.8%  | 1.1%  | 4.5%  | 65.2% | 4.2%  | 3.2%  | 7.0%          | 14.0% |
| Ba            | 0.3%  | 0.2%  | 1.1%  | 4.3%  | 64.9% | 4.3%  | 11.2%         | 13.7% |
| B             | 0.1%  | 0.0%  | 0.2%  | 0.7%  | 3.3%  | 69.0% | 14.9%         | 11.8% |
| Caa and below | 0.1%  | 0.0%  | 0.0%  | 0.1%  | 0.3%  | 0.9%  | 81.4%         | 17.3% |
| 3-year        | Aaa   | Aa    | A     | Baa   | Ba    | B     | Caa and below | WR    |
| Aaa           | 57.6% | 0.7%  | 0.4%  | 0.2%  | 0.1%  | 0.1%  | 0.1%          | 40.9% |
| Aa            | 13.4% | 51.8% | 3.0%  | 1.6%  | 0.6%  | 0.5%  | 0.7%          | 28.4% |
| A             | 3.7%  | 6.9%  | 53.3% | 3.8%  | 1.8%  | 0.8%  | 1.6%          | 28.1% |
| Baa           | 1.5%  | 1.7%  | 6.0%  | 51.9% | 4.9%  | 3.4%  | 6.5%          | 24.1% |
| Ba            | 0.4%  | 0.4%  | 1.8%  | 5.7%  | 52.6% | 4.6%  | 11.9%         | 22.6% |
| B             | 0.1%  | 0.1%  | 0.3%  | 1.0%  | 4.0%  | 56.3% | 19.4%         | 18.9% |
| Caa and below | 0.1%  | 0.0%  | 0.0%  | 0.2%  | 0.3%  | 0.8%  | 72.1%         | 26.5% |
| 4-year        | Aaa   | Aa    | A     | Baa   | Ba    | B     | Caa and below | WR    |
| Aaa           | 45.7% | 0.6%  | 0.4%  | 0.2%  | 0.1%  | 0.1%  | 0.1%          | 52.9% |
| Aa            | 15.6% | 38.0% | 2.8%  | 1.7%  | 0.7%  | 0.6%  | 1.0%          | 39.7% |
| A             | 4.6%  | 7.1%  | 40.4% | 3.2%  | 1.8%  | 0.8%  | 1.8%          | 40.3% |
| Baa           | 2.1%  | 2.2%  | 6.7%  | 39.1% | 4.6%  | 3.1%  | 7.7%          | 34.5% |
| Ba            | 0.6%  | 0.6%  | 2.3%  | 6.3%  | 40.6% | 4.5%  | 13.4%         | 31.8% |
| B             | 0.2%  | 0.0%  | 0.3%  | 1.4%  | 3.9%  | 44.7% | 22.9%         | 26.8% |
| Caa and below | 0.0%  | 0.0%  | 0.0%  | 0.3%  | 0.3%  | 0.6%  | 63.4%         | 35.4% |
| 5-year        | Aaa   | Aa    | A     | Baa   | Ba    | B     | Caa and below | WR    |
| Aaa           | 35.8% | 0.5%  | 0.4%  | 0.2%  | 0.1%  | 0.1%  | 0.1%          | 62.9% |
| Aa            | 15.8% | 27.6% | 2.5%  | 1.6%  | 0.6%  | 0.7%  | 1.2%          | 49.9% |
| A             | 5.2%  | 6.1%  | 29.9% | 2.8%  | 1.7%  | 0.7%  | 2.2%          | 51.3% |
| Baa           | 2.7%  | 2.5%  | 6.5%  | 28.9% | 3.6%  | 2.6%  | 9.3%          | 43.9% |
| Ba            | 0.6%  | 0.7%  | 2.5%  | 6.3%  | 30.4% | 3.9%  | 15.2%         | 40.4% |
| B             | 0.2%  | 0.0%  | 0.2%  | 1.6%  | 3.2%  | 35.0% | 24.9%         | 34.9% |
| Caa and below | 0.0%  | 0.0%  | 0.0%  | 0.3%  | 0.2%  | 0.4%  | 54.8%         | 44.2% |



**Exhibit 40: Global Structured Finance Rating Transition Matrices excluding SF CDOs, and 2005 -2007 Vintage US HEL & RMBS by Cohort Rating (1984-2008)**

| <b>1-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
|---------------|------------|-----------|----------|------------|-----------|----------|----------------------|-----------|
| Aaa           | 84.7%      | 0.4%      | 0.2%     | 0.1%       | 0.0%      | 0.0%     | 0.0%                 | 14.4%     |
| Aa            | 6.1%       | 82.8%     | 1.7%     | 0.5%       | 0.1%      | 0.1%     | 0.1%                 | 8.5%      |
| A             | 1.2%       | 3.7%      | 83.7%    | 2.4%       | 0.6%      | 0.3%     | 0.2%                 | 8.0%      |
| Baa           | 0.4%       | 0.5%      | 2.9%     | 83.7%      | 2.9%      | 1.5%     | 1.2%                 | 7.0%      |
| Ba            | 0.2%       | 0.1%      | 0.5%     | 2.8%       | 83.6%     | 3.0%     | 3.8%                 | 6.2%      |
| B             | 0.1%       | 0.0%      | 0.1%     | 0.3%       | 1.9%      | 82.9%    | 9.3%                 | 5.5%      |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.1%      | 0.5%     | 90.5%                | 8.9%      |
| <b>2-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 70.1%      | 0.5%      | 0.3%     | 0.1%       | 0.0%      | 0.0%     | 0.0%                 | 28.8%     |
| Aa            | 10.9%      | 66.2%     | 2.3%     | 1.1%       | 0.3%      | 0.2%     | 0.3%                 | 18.7%     |
| A             | 2.7%       | 6.0%      | 68.0%    | 3.1%       | 1.2%      | 0.5%     | 0.6%                 | 17.8%     |
| Baa           | 0.9%       | 1.2%      | 5.1%     | 67.9%      | 4.0%      | 2.4%     | 2.9%                 | 15.5%     |
| Ba            | 0.3%       | 0.3%      | 1.2%     | 4.7%       | 68.3%     | 4.1%     | 7.3%                 | 13.9%     |
| B             | 0.1%       | 0.0%      | 0.2%     | 0.7%       | 3.3%      | 69.3%    | 14.5%                | 11.9%     |
| Caa and below | 0.1%       | 0.0%      | 0.0%     | 0.1%       | 0.2%      | 0.8%     | 81.0%                | 17.8%     |
| <b>3-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 57.0%      | 0.6%      | 0.3%     | 0.2%       | 0.0%      | 0.1%     | 0.1%                 | 41.8%     |
| Aa            | 14.1%      | 51.1%     | 2.7%     | 1.5%       | 0.5%      | 0.4%     | 0.5%                 | 29.3%     |
| A             | 3.9%       | 7.1%      | 53.3%    | 3.4%       | 1.6%      | 0.7%     | 1.1%                 | 29.0%     |
| Baa           | 1.6%       | 1.8%      | 6.3%     | 52.6%      | 4.7%      | 3.1%     | 5.0%                 | 25.0%     |
| Ba            | 0.5%       | 0.5%      | 1.9%     | 5.8%       | 53.9%     | 4.5%     | 10.6%                | 22.3%     |
| B             | 0.1%       | 0.1%      | 0.3%     | 1.1%       | 4.0%      | 56.6%    | 19.0%                | 19.0%     |
| Caa and below | 0.1%       | 0.0%      | 0.0%     | 0.2%       | 0.2%      | 0.7%     | 71.7%                | 27.1%     |
| <b>4-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 45.4%      | 0.5%      | 0.3%     | 0.2%       | 0.1%      | 0.1%     | 0.1%                 | 53.3%     |
| Aa            | 15.9%      | 37.8%     | 2.8%     | 1.6%       | 0.6%      | 0.5%     | 0.8%                 | 40.0%     |
| A             | 4.7%       | 7.0%      | 40.4%    | 3.2%       | 1.7%      | 0.8%     | 1.6%                 | 40.5%     |
| Baa           | 2.2%       | 2.2%      | 6.8%     | 39.4%      | 4.6%      | 3.1%     | 6.9%                 | 34.8%     |
| Ba            | 0.6%       | 0.6%      | 2.3%     | 6.3%       | 41.3%     | 4.5%     | 13.2%                | 31.1%     |
| B             | 0.2%       | 0.0%      | 0.3%     | 1.4%       | 3.8%      | 44.9%    | 22.6%                | 26.8%     |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.3%       | 0.2%      | 0.5%     | 63.4%                | 35.6%     |
| <b>5-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 35.5%      | 0.5%      | 0.3%     | 0.2%       | 0.1%      | 0.1%     | 0.1%                 | 63.2%     |
| Aa            | 16.0%      | 27.5%     | 2.5%     | 1.5%       | 0.5%      | 0.7%     | 1.1%                 | 50.1%     |
| A             | 5.3%       | 6.0%      | 29.9%    | 2.8%       | 1.7%      | 0.7%     | 2.0%                 | 51.5%     |
| Baa           | 2.8%       | 2.5%      | 6.6%     | 29.1%      | 3.7%      | 2.6%     | 8.5%                 | 44.2%     |
| Ba            | 0.6%       | 0.7%      | 2.6%     | 6.2%       | 30.9%     | 4.0%     | 15.1%                | 39.9%     |
| B             | 0.2%       | 0.0%      | 0.2%     | 1.6%       | 3.1%      | 35.1%    | 24.9%                | 34.9%     |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.3%       | 0.2%      | 0.4%     | 54.8%                | 44.3%     |

**Exhibit 41: US ABS Rating Transition Matrices by Cohort Rating (1984-2008)**

| <b>1-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
|---------------|------------|-----------|----------|------------|-----------|----------|----------------------|-----------|
| Aaa           | 81.9%      | 1.0%      | 0.7%     | 0.5%       | 0.2%      | 0.2%     | 0.1%                 | 15.4%     |
| Aa            | 2.0%       | 82.0%     | 2.8%     | 1.6%       | 1.1%      | 2.3%     | 2.5%                 | 5.7%      |
| A             | 0.4%       | 1.8%      | 79.4%    | 4.3%       | 1.7%      | 2.3%     | 3.3%                 | 6.7%      |
| Baa           | 0.1%       | 0.2%      | 0.9%     | 75.1%      | 4.9%      | 4.5%     | 9.7%                 | 4.7%      |
| Ba            | 0.0%       | 0.1%      | 0.1%     | 0.9%       | 62.2%     | 6.5%     | 25.1%                | 5.1%      |
| B             | 0.0%       | 0.0%      | 0.1%     | 0.1%       | 0.1%      | 58.7%    | 35.8%                | 5.3%      |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 0.0%     | 88.1%                | 11.8%     |
| <b>2-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 65.9%      | 1.0%      | 0.6%     | 0.4%       | 0.1%      | 0.1%     | 0.1%                 | 31.6%     |
| Aa            | 3.9%       | 71.4%     | 3.6%     | 2.3%       | 0.9%      | 1.2%     | 2.3%                 | 14.4%     |
| A             | 0.9%       | 3.3%      | 68.1%    | 5.0%       | 2.0%      | 1.5%     | 3.0%                 | 16.2%     |
| Baa           | 0.3%       | 0.4%      | 1.8%     | 64.2%      | 6.4%      | 5.1%     | 10.5%                | 11.4%     |
| Ba            | 0.1%       | 0.2%      | 0.3%     | 1.0%       | 50.4%     | 7.5%     | 28.4%                | 12.2%     |
| B             | 0.0%       | 0.0%      | 0.2%     | 0.2%       | 0.3%      | 54.9%    | 34.3%                | 10.2%     |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.1%      | 0.1%     | 80.9%                | 19.0%     |
| <b>3-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 52.3%      | 0.9%      | 0.7%     | 0.4%       | 0.1%      | 0.1%     | 0.2%                 | 45.3%     |
| Aa            | 5.4%       | 58.6%     | 4.1%     | 2.9%       | 0.9%      | 1.0%     | 1.6%                 | 25.4%     |
| A             | 1.1%       | 3.9%      | 55.6%    | 5.2%       | 2.4%      | 0.9%     | 1.8%                 | 29.0%     |
| Baa           | 0.4%       | 0.5%      | 2.4%     | 52.2%      | 8.0%      | 5.7%     | 10.1%                | 20.7%     |
| Ba            | 0.2%       | 0.3%      | 0.3%     | 1.3%       | 39.6%     | 7.5%     | 30.8%                | 20.0%     |
| B             | 0.0%       | 0.0%      | 0.4%     | 0.4%       | 0.5%      | 40.3%    | 40.5%                | 18.0%     |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.1%      | 0.1%     | 69.8%                | 30.1%     |
| <b>4-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 41.9%      | 0.9%      | 0.7%     | 0.4%       | 0.2%      | 0.2%     | 0.2%                 | 55.5%     |
| Aa            | 5.9%       | 44.8%     | 4.2%     | 3.3%       | 1.0%      | 1.6%     | 2.6%                 | 36.6%     |
| A             | 1.1%       | 3.6%      | 43.3%    | 4.4%       | 2.5%      | 1.0%     | 2.2%                 | 42.0%     |
| Baa           | 0.3%       | 0.6%      | 2.3%     | 40.4%      | 7.8%      | 5.3%     | 12.5%                | 30.7%     |
| Ba            | 0.2%       | 0.3%      | 0.4%     | 1.2%       | 27.9%     | 6.6%     | 34.9%                | 28.5%     |
| B             | 0.1%       | 0.0%      | 0.5%     | 0.6%       | 0.8%      | 26.5%    | 43.9%                | 27.6%     |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 0.0%     | 57.3%                | 42.6%     |
| <b>5-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 33.1%      | 0.9%      | 0.8%     | 0.5%       | 0.2%      | 0.2%     | 0.3%                 | 64.1%     |
| Aa            | 5.5%       | 34.2%     | 4.1%     | 3.4%       | 0.9%      | 2.1%     | 3.5%                 | 46.2%     |
| A             | 1.2%       | 2.7%      | 32.7%    | 3.9%       | 2.4%      | 1.0%     | 2.8%                 | 53.3%     |
| Baa           | 0.4%       | 0.7%      | 2.0%     | 30.5%      | 6.0%      | 4.0%     | 16.5%                | 39.9%     |
| Ba            | 0.3%       | 0.3%      | 0.5%     | 1.1%       | 18.7%     | 4.2%     | 39.0%                | 36.0%     |
| B             | 0.3%       | 0.0%      | 0.4%     | 1.0%       | 1.0%      | 16.4%    | 41.9%                | 39.0%     |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 0.0%     | 41.0%                | 58.9%     |

**Exhibit 42: US ABS ex HEL Rating Transition Matrices by Cohort Rating (1984-2008)**

| <b>1-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
|---------------|------------|-----------|----------|------------|-----------|----------|----------------------|-----------|
| Aaa           | 83.4%      | 1.0%      | 0.6%     | 0.2%       | 0.1%      | 0.0%     | 0.0%                 | 14.6%     |
| Aa            | 2.7%       | 81.6%     | 3.2%     | 1.3%       | 0.4%      | 0.4%     | 0.8%                 | 9.7%      |
| A             | 0.7%       | 2.2%      | 82.0%    | 3.1%       | 0.7%      | 0.3%     | 0.4%                 | 10.6%     |
| Baa           | 0.4%       | 0.4%      | 1.4%     | 82.6%      | 4.3%      | 1.4%     | 1.7%                 | 7.9%      |
| Ba            | 0.1%       | 0.1%      | 0.3%     | 1.9%       | 73.4%     | 6.7%     | 10.9%                | 6.6%      |
| B             | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 74.2%    | 22.7%                | 3.1%      |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 0.1%     | 93.0%                | 6.9%      |
| <b>2-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 67.9%      | 1.2%      | 0.8%     | 0.3%       | 0.1%      | 0.1%     | 0.1%                 | 29.5%     |
| Aa            | 3.6%       | 65.3%     | 3.8%     | 3.2%       | 1.2%      | 1.0%     | 2.0%                 | 19.9%     |
| A             | 1.3%       | 3.0%      | 66.1%    | 3.8%       | 1.5%      | 0.6%     | 1.1%                 | 22.6%     |
| Baa           | 0.8%       | 0.8%      | 1.9%     | 66.6%      | 5.8%      | 2.3%     | 4.3%                 | 17.5%     |
| Ba            | 0.2%       | 0.2%      | 0.5%     | 1.3%       | 52.7%     | 8.0%     | 22.1%                | 14.9%     |
| B             | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 56.5%    | 37.0%                | 6.5%      |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.1%      | 0.1%     | 85.8%                | 14.0%     |
| <b>3-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 53.8%      | 1.2%      | 0.8%     | 0.4%       | 0.2%      | 0.2%     | 0.2%                 | 43.1%     |
| Aa            | 3.9%       | 51.8%     | 3.8%     | 4.4%       | 1.6%      | 1.8%     | 3.1%                 | 29.5%     |
| A             | 1.3%       | 2.8%      | 52.1%    | 3.4%       | 2.0%      | 0.8%     | 1.9%                 | 35.7%     |
| Baa           | 0.8%       | 0.7%      | 1.8%     | 51.9%      | 6.4%      | 2.9%     | 7.5%                 | 28.0%     |
| Ba            | 0.4%       | 0.2%      | 0.2%     | 1.2%       | 36.2%     | 7.4%     | 32.1%                | 22.3%     |
| B             | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 40.6%    | 48.7%                | 10.7%     |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.1%      | 0.1%     | 78.3%                | 21.5%     |
| <b>4-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 42.6%      | 1.1%      | 0.9%     | 0.5%       | 0.3%      | 0.3%     | 0.3%                 | 54.0%     |
| Aa            | 4.0%       | 40.9%     | 3.4%     | 4.4%       | 1.6%      | 2.7%     | 4.4%                 | 38.6%     |
| A             | 1.0%       | 2.2%      | 41.1%    | 3.1%       | 2.3%      | 0.8%     | 2.5%                 | 47.0%     |
| Baa           | 0.6%       | 0.5%      | 1.4%     | 40.8%      | 7.2%      | 3.3%     | 11.0%                | 35.2%     |
| Ba            | 0.3%       | 0.3%      | 0.1%     | 0.8%       | 20.1%     | 6.1%     | 44.3%                | 28.0%     |
| B             | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 24.0%    | 58.9%                | 17.1%     |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 0.0%     | 68.6%                | 31.3%     |
| <b>5-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 33.9%      | 1.0%      | 1.0%     | 0.5%       | 0.3%      | 0.4%     | 0.4%                 | 62.4%     |
| Aa            | 4.2%       | 32.2%     | 2.9%     | 4.0%       | 1.3%      | 3.3%     | 5.4%                 | 46.7%     |
| A             | 1.1%       | 1.8%      | 31.9%    | 2.8%       | 2.2%      | 0.8%     | 3.0%                 | 56.4%     |
| Baa           | 0.7%       | 0.6%      | 1.2%     | 31.1%      | 6.2%      | 3.4%     | 16.0%                | 40.8%     |
| Ba            | 0.4%       | 0.3%      | 0.0%     | 0.7%       | 9.4%      | 2.9%     | 52.5%                | 33.7%     |
| B             | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 13.8%    | 61.4%                | 24.8%     |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.1%       | 0.0%      | 0.0%     | 53.6%                | 46.3%     |

**Exhibit 43: US HEL Rating Transition Matrices by Cohort Rating (1989-2008)**

| <b>1-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
|---------------|------------|-----------|----------|------------|-----------|----------|----------------------|-----------|
| Aaa           | 80.5%      | 1.0%      | 0.8%     | 0.9%       | 0.3%      | 0.3%     | 0.2%                 | 16.1%     |
| Aa            | 1.7%       | 82.1%     | 2.6%     | 1.8%       | 1.4%      | 3.3%     | 3.4%                 | 3.8%      |
| A             | 0.2%       | 1.5%      | 77.0%    | 5.5%       | 2.7%      | 4.2%     | 6.0%                 | 3.0%      |
| Baa           | 0.0%       | 0.1%      | 0.7%     | 72.2%      | 5.2%      | 5.7%     | 12.7%                | 3.5%      |
| Ba            | 0.0%       | 0.0%      | 0.1%     | 0.5%       | 57.3%     | 6.4%     | 31.3%                | 4.4%      |
| B             | 0.0%       | 0.0%      | 0.1%     | 0.1%       | 0.2%      | 46.1%    | 46.4%                | 7.1%      |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 0.0%     | 80.2%                | 19.8%     |
| <b>2-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 63.8%      | 0.7%      | 0.5%     | 0.6%       | 0.1%      | 0.1%     | 0.2%                 | 33.9%     |
| Aa            | 4.1%       | 75.4%     | 3.6%     | 1.7%       | 0.8%      | 1.2%     | 2.5%                 | 10.7%     |
| A             | 0.4%       | 3.6%      | 70.5%    | 6.6%       | 2.7%      | 2.7%     | 5.4%                 | 8.2%      |
| Baa           | 0.1%       | 0.2%      | 1.7%     | 63.0%      | 6.7%      | 6.4%     | 13.4%                | 8.6%      |
| Ba            | 0.0%       | 0.1%      | 0.2%     | 0.8%       | 48.9%     | 7.2%     | 32.3%                | 10.6%     |
| B             | 0.0%       | 0.0%      | 0.4%     | 0.4%       | 0.7%      | 52.7%    | 30.6%                | 15.2%     |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 0.0%     | 69.3%                | 30.7%     |
| <b>3-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 50.6%      | 0.6%      | 0.4%     | 0.5%       | 0.0%      | 0.0%     | 0.1%                 | 47.8%     |
| Aa            | 6.9%       | 65.0%     | 4.4%     | 1.4%       | 0.3%      | 0.2%     | 0.3%                 | 21.6%     |
| A             | 0.8%       | 6.1%      | 62.0%    | 8.6%       | 3.0%      | 1.2%     | 1.6%                 | 16.7%     |
| Baa           | 0.1%       | 0.4%      | 2.7%     | 52.5%      | 9.1%      | 7.4%     | 11.8%                | 16.0%     |
| Ba            | 0.0%       | 0.3%      | 0.4%     | 1.5%       | 42.8%     | 7.7%     | 29.5%                | 17.9%     |
| B             | 0.0%       | 0.0%      | 0.8%     | 0.8%       | 1.1%      | 40.0%    | 29.9%                | 27.3%     |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 0.0%     | 53.0%                | 47.0%     |
| <b>4-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 40.9%      | 0.7%      | 0.5%     | 0.4%       | 0.0%      | 0.0%     | 0.1%                 | 57.3%     |
| Aa            | 8.4%       | 49.8%     | 5.3%     | 1.9%       | 0.3%      | 0.1%     | 0.2%                 | 34.1%     |
| A             | 1.3%       | 7.1%      | 49.0%    | 7.9%       | 3.0%      | 1.4%     | 1.4%                 | 28.9%     |
| Baa           | 0.1%       | 0.6%      | 3.1%     | 40.1%      | 8.3%      | 7.0%     | 13.9%                | 26.9%     |
| Ba            | 0.1%       | 0.4%      | 0.7%     | 1.8%       | 37.2%     | 7.1%     | 23.6%                | 29.0%     |
| B             | 0.2%       | 0.0%      | 0.9%     | 1.3%       | 1.6%      | 29.1%    | 28.0%                | 38.8%     |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 0.0%     | 41.1%                | 58.9%     |
| <b>5-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 32.1%      | 0.7%      | 0.5%     | 0.4%       | 0.0%      | 0.0%     | 0.2%                 | 66.2%     |
| Aa            | 7.7%       | 37.3%     | 6.0%     | 2.6%       | 0.4%      | 0.1%     | 0.5%                 | 45.4%     |
| A             | 1.7%       | 5.7%      | 35.5%    | 8.0%       | 3.1%      | 1.6%     | 2.0%                 | 42.4%     |
| Baa           | 0.1%       | 0.7%      | 2.9%     | 29.9%      | 5.8%      | 4.6%     | 17.0%                | 39.0%     |
| Ba            | 0.1%       | 0.3%      | 1.0%     | 1.6%       | 29.5%     | 5.6%     | 23.3%                | 38.6%     |
| B             | 0.5%       | 0.0%      | 0.7%     | 1.8%       | 1.8%      | 18.5%    | 26.8%                | 49.9%     |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 0.0%     | 30.5%                | 69.5%     |

**Exhibit 44: US RMBS Rating Transition Matrices by Cohort Rating (1984-2008)**

| <b>1-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
|---------------|------------|-----------|----------|------------|-----------|----------|----------------------|-----------|
| Aaa           | 87.3%      | 0.5%      | 0.4%     | 0.3%       | 0.2%      | 0.1%     | 0.0%                 | 11.3%     |
| Aa            | 6.1%       | 80.7%     | 1.6%     | 0.9%       | 0.7%      | 2.1%     | 1.0%                 | 6.9%      |
| A             | 1.0%       | 4.1%      | 76.2%    | 2.9%       | 1.5%      | 4.0%     | 4.7%                 | 5.6%      |
| Baa           | 0.3%       | 0.4%      | 3.4%     | 76.2%      | 2.4%      | 3.4%     | 8.9%                 | 4.9%      |
| Ba            | 0.1%       | 0.1%      | 0.8%     | 4.6%       | 79.5%     | 1.9%     | 7.9%                 | 5.0%      |
| B             | 0.0%       | 0.0%      | 0.1%     | 0.4%       | 3.9%      | 83.0%    | 6.3%                 | 6.3%      |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.2%      | 0.0%     | 91.6%                | 8.3%      |
| <b>2-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 74.2%      | 0.4%      | 0.3%     | 0.2%       | 0.1%      | 0.0%     | 0.0%                 | 24.7%     |
| Aa            | 12.7%      | 65.3%     | 2.1%     | 0.9%       | 0.5%      | 1.0%     | 0.6%                 | 16.8%     |
| A             | 3.3%       | 8.0%      | 64.2%    | 2.3%       | 1.5%      | 2.5%     | 3.8%                 | 14.5%     |
| Baa           | 0.8%       | 1.4%      | 7.0%     | 66.1%      | 1.9%      | 2.5%     | 7.1%                 | 13.2%     |
| Ba            | 0.3%       | 0.3%      | 2.7%     | 8.6%       | 68.0%     | 1.8%     | 5.8%                 | 12.6%     |
| B             | 0.1%       | 0.1%      | 0.3%     | 0.9%       | 7.5%      | 70.8%    | 5.1%                 | 15.2%     |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.4%      | 0.0%     | 82.9%                | 16.6%     |
| <b>3-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 60.5%      | 0.3%      | 0.1%     | 0.1%       | 0.0%      | 0.0%     | 0.0%                 | 38.9%     |
| Aa            | 17.9%      | 49.8%     | 2.2%     | 0.8%       | 0.2%      | 0.1%     | 0.1%                 | 28.9%     |
| A             | 6.2%       | 10.9%     | 51.1%    | 2.0%       | 1.2%      | 0.9%     | 1.2%                 | 26.6%     |
| Baa           | 1.5%       | 2.5%      | 9.6%     | 55.3%      | 1.6%      | 1.5%     | 3.1%                 | 24.9%     |
| Ba            | 0.6%       | 0.3%      | 4.7%     | 10.8%      | 56.0%     | 1.9%     | 3.5%                 | 22.2%     |
| B             | 0.1%       | 0.2%      | 0.3%     | 1.6%       | 8.9%      | 57.7%    | 5.6%                 | 25.6%     |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.7%      | 0.0%     | 76.0%                | 23.3%     |
| <b>4-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 47.5%      | 0.2%      | 0.1%     | 0.0%       | 0.0%      | 0.0%     | 0.0%                 | 52.2%     |
| Aa            | 20.3%      | 35.9%     | 2.0%     | 0.7%       | 0.2%      | 0.1%     | 0.1%                 | 40.6%     |
| A             | 8.4%       | 11.4%     | 36.7%    | 1.7%       | 0.8%      | 0.5%     | 1.1%                 | 39.5%     |
| Baa           | 2.3%       | 3.2%      | 10.1%    | 42.6%      | 1.3%      | 1.1%     | 2.2%                 | 37.2%     |
| Ba            | 0.8%       | 0.5%      | 5.8%     | 11.0%      | 43.7%     | 1.8%     | 3.1%                 | 33.3%     |
| B             | 0.2%       | 0.1%      | 0.2%     | 2.2%       | 8.0%      | 45.9%    | 5.7%                 | 37.7%     |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.9%      | 0.0%     | 70.1%                | 29.0%     |
| <b>5-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 36.8%      | 0.1%      | 0.1%     | 0.0%       | 0.0%      | 0.0%     | 0.0%                 | 62.76%    |
| Aa            | 20.0%      | 26.0%     | 1.8%     | 0.6%       | 0.2%      | 0.2%     | 0.2%                 | 50.85%    |
| A             | 8.8%       | 9.7%      | 27.1%    | 1.4%       | 0.6%      | 0.4%     | 1.3%                 | 50.09%    |
| Baa           | 2.9%       | 3.0%      | 8.8%     | 33.5%      | 1.0%      | 1.2%     | 2.2%                 | 45.52%    |
| Ba            | 0.8%       | 0.7%      | 5.8%     | 9.8%       | 34.1%     | 1.6%     | 3.3%                 | 41.67%    |
| B             | 0.4%       | 0.1%      | 0.1%     | 2.5%       | 5.5%      | 36.5%    | 5.8%                 | 47.81%    |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 1.0%      | 0.0%     | 64.4%                | 41.37%    |

**Exhibit 45: US CMBS Rating Transition Matrices by Cohort Rating (1987-2008)**

| <b>1-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
|---------------|------------|-----------|----------|------------|-----------|----------|----------------------|-----------|
| Aaa           | 90.4%      | 0.4%      | 0.0%     | 0.0%       | 0.0%      | 0.0%     | 0.0%                 | 9.2%      |
| Aa            | 15.6%      | 76.4%     | 0.7%     | 0.1%       | 0.1%      | 0.1%     | 0.0%                 | 7.0%      |
| A             | 3.8%       | 9.7%      | 79.8%    | 1.1%       | 0.2%      | 0.0%     | 0.0%                 | 5.2%      |
| Baa           | 0.9%       | 1.2%      | 6.4%     | 82.5%      | 1.7%      | 0.3%     | 0.2%                 | 6.8%      |
| Ba            | 0.2%       | 0.0%      | 0.5%     | 3.1%       | 90.6%     | 2.1%     | 0.2%                 | 3.3%      |
| B             | 0.1%       | 0.0%      | 0.0%     | 0.2%       | 1.0%      | 91.5%    | 5.1%                 | 2.1%      |
| Caa and below | 0.1%       | 0.0%      | 0.0%     | 0.0%       | 0.1%      | 0.9%     | 91.8%                | 7.2%      |
| <b>2-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 80.3%      | 0.5%      | 0.1%     | 0.0%       | 0.0%      | 0.0%     | 0.0%                 | 19.1%     |
| Aa            | 26.3%      | 55.1%     | 1.1%     | 0.2%       | 0.2%      | 0.0%     | 0.1%                 | 16.9%     |
| A             | 10.0%      | 15.3%     | 59.7%    | 1.7%       | 0.5%      | 0.0%     | 0.0%                 | 12.6%     |
| Baa           | 2.9%       | 3.2%      | 11.2%    | 64.2%      | 2.1%      | 0.5%     | 0.3%                 | 15.5%     |
| Ba            | 0.5%       | 0.2%      | 1.2%     | 5.8%       | 80.5%     | 3.7%     | 0.7%                 | 7.3%      |
| B             | 0.1%       | 0.0%      | 0.1%     | 0.4%       | 1.9%      | 82.3%    | 10.3%                | 4.9%      |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.1%      | 1.4%     | 83.9%                | 14.5%     |
| <b>3-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 70.7%      | 0.6%      | 0.1%     | 0.0%       | 0.0%      | 0.0%     | 0.0%                 | 28.6%     |
| Aa            | 32.4%      | 39.1%     | 1.2%     | 0.4%       | 0.4%      | 0.0%     | 0.2%                 | 26.2%     |
| A             | 16.0%      | 17.5%     | 43.8%    | 2.0%       | 0.7%      | 0.1%     | 0.0%                 | 19.9%     |
| Baa           | 5.5%       | 5.1%      | 13.8%    | 49.0%      | 2.1%      | 0.5%     | 0.4%                 | 23.6%     |
| Ba            | 0.8%       | 0.7%      | 1.9%     | 8.0%       | 70.2%     | 5.1%     | 1.7%                 | 11.7%     |
| B             | 0.1%       | 0.0%      | 0.2%     | 0.6%       | 2.3%      | 71.6%    | 16.5%                | 8.7%      |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.1%      | 1.9%     | 76.6%                | 21.4%     |
| <b>4-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 62.3%      | 0.6%      | 0.2%     | 0.0%       | 0.0%      | 0.0%     | 0.0%                 | 36.9%     |
| Aa            | 35.4%      | 27.5%     | 1.4%     | 0.3%       | 0.6%      | 0.0%     | 0.3%                 | 34.4%     |
| A             | 20.8%      | 18.4%     | 31.5%    | 2.2%       | 0.6%      | 0.1%     | 0.0%                 | 26.3%     |
| Baa           | 7.9%       | 6.2%      | 15.2%    | 36.5%      | 2.1%      | 0.4%     | 0.6%                 | 31.0%     |
| Ba            | 1.0%       | 1.2%      | 2.4%     | 9.8%       | 59.2%     | 6.5%     | 3.2%                 | 16.7%     |
| B             | 0.0%       | 0.0%      | 0.2%     | 1.0%       | 2.5%      | 59.8%    | 23.3%                | 13.2%     |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 2.5%     | 70.3%                | 27.2%     |
| <b>5-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 54.7%      | 0.7%      | 0.2%     | 0.0%       | 0.0%      | 0.0%     | 0.0%                 | 44.4%     |
| Aa            | 35.4%      | 19.3%     | 1.5%     | 0.3%       | 0.8%      | 0.0%     | 0.4%                 | 42.3%     |
| A             | 25.5%      | 17.8%     | 21.5%    | 2.1%       | 0.6%      | 0.1%     | 0.0%                 | 32.3%     |
| Baa           | 10.0%      | 7.3%      | 16.1%    | 27.0%      | 1.8%      | 0.5%     | 0.7%                 | 36.6%     |
| Ba            | 1.1%       | 1.8%      | 3.0%     | 10.9%      | 49.1%     | 7.5%     | 4.9%                 | 21.7%     |
| B             | 0.0%       | 0.0%      | 0.2%     | 1.3%       | 2.6%      | 49.1%    | 28.8%                | 18.0%     |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 3.3%     | 65.2%                | 31.5%     |

**Exhibit 46: US CDO Rating Transition Matrices by Cohort Rating (1990-2008)**

| <b>1-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
|---------------|------------|-----------|----------|------------|-----------|----------|----------------------|-----------|
| Aaa           | 82.7%      | 2.2%      | 1.4%     | 1.0%       | 1.1%      | 1.1%     | 3.7%                 | 6.8%      |
| Aa            | 1.3%       | 78.7%     | 3.5%     | 2.1%       | 1.5%      | 1.1%     | 5.4%                 | 6.4%      |
| A             | 0.6%       | 1.2%      | 79.6%    | 2.9%       | 1.8%      | 1.1%     | 6.5%                 | 6.4%      |
| Baa           | 0.2%       | 0.4%      | 0.6%     | 78.7%      | 3.5%      | 2.4%     | 8.1%                 | 6.2%      |
| Ba            | 0.0%       | 0.1%      | 0.2%     | 0.9%       | 77.4%     | 3.4%     | 10.1%                | 7.8%      |
| B             | 0.0%       | 0.1%      | 0.2%     | 0.8%       | 1.9%      | 64.0%    | 24.2%                | 8.7%      |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.1%       | 0.2%      | 0.8%     | 92.0%                | 6.9%      |
| <b>2-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 75.3%      | 3.3%      | 1.9%     | 1.1%       | 0.9%      | 0.7%     | 1.4%                 | 15.4%     |
| Aa            | 2.8%       | 66.5%     | 5.4%     | 3.5%       | 2.2%      | 1.5%     | 3.1%                 | 15.1%     |
| A             | 1.3%       | 2.5%      | 68.7%    | 3.6%       | 2.1%      | 1.6%     | 5.0%                 | 15.2%     |
| Baa           | 0.5%       | 0.8%      | 1.1%     | 65.2%      | 5.3%      | 3.9%     | 9.0%                 | 14.4%     |
| Ba            | 0.1%       | 0.3%      | 0.4%     | 2.1%       | 61.9%     | 4.8%     | 13.1%                | 17.3%     |
| B             | 0.1%       | 0.1%      | 0.2%     | 1.5%       | 3.2%      | 45.8%    | 31.0%                | 18.0%     |
| Caa and below | 0.0%       | 0.0%      | 0.1%     | 0.3%       | 0.5%      | 1.5%     | 85.4%                | 12.3%     |
| <b>3-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 63.9%      | 4.1%      | 2.4%     | 1.4%       | 0.7%      | 0.5%     | 0.4%                 | 26.7%     |
| Aa            | 3.6%       | 51.8%     | 6.8%     | 4.9%       | 3.0%      | 1.7%     | 2.0%                 | 26.1%     |
| A             | 1.9%       | 3.5%      | 54.7%    | 3.7%       | 2.6%      | 2.0%     | 4.3%                 | 27.2%     |
| Baa           | 0.7%       | 1.0%      | 1.5%     | 48.4%      | 6.3%      | 5.3%     | 12.7%                | 24.0%     |
| Ba            | 0.1%       | 0.5%      | 0.5%     | 2.7%       | 45.4%     | 5.3%     | 17.7%                | 27.8%     |
| B             | 0.3%       | 0.2%      | 0.3%     | 2.0%       | 3.8%      | 31.6%    | 36.5%                | 25.4%     |
| Caa and below | 0.0%       | 0.0%      | 0.1%     | 0.5%       | 0.6%      | 1.6%     | 79.0%                | 18.3%     |
| <b>4-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 51.3%      | 4.3%      | 2.4%     | 1.6%       | 0.9%      | 0.5%     | 0.4%                 | 38.5%     |
| Aa            | 4.2%       | 37.2%     | 6.8%     | 5.9%       | 3.6%      | 2.1%     | 3.1%                 | 37.1%     |
| A             | 2.2%       | 4.3%      | 40.2%    | 3.3%       | 2.7%      | 2.0%     | 5.1%                 | 40.2%     |
| Baa           | 0.8%       | 1.2%      | 1.7%     | 33.1%      | 6.4%      | 5.6%     | 17.3%                | 33.9%     |
| Ba            | 0.1%       | 0.5%      | 0.3%     | 2.8%       | 32.1%     | 5.0%     | 21.3%                | 37.8%     |
| B             | 0.2%       | 0.0%      | 0.3%     | 1.9%       | 3.5%      | 23.7%    | 39.0%                | 31.3%     |
| Caa and below | 0.0%       | 0.0%      | 0.1%     | 0.4%       | 0.6%      | 1.0%     | 74.4%                | 23.5%     |
| <b>5-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 39.5%      | 4.0%      | 2.0%     | 1.7%       | 1.0%      | 0.7%     | 0.5%                 | 50.6%     |
| Aa            | 4.7%       | 25.0%     | 6.3%     | 6.1%       | 3.7%      | 2.0%     | 4.3%                 | 47.9%     |
| A             | 2.3%       | 4.7%      | 26.1%    | 3.0%       | 2.4%      | 2.0%     | 5.7%                 | 53.8%     |
| Baa           | 0.6%       | 1.2%      | 1.5%     | 20.7%      | 6.4%      | 5.7%     | 20.4%                | 43.5%     |
| Ba            | 0.1%       | 0.2%      | 0.4%     | 2.3%       | 20.6%     | 4.6%     | 24.2%                | 47.5%     |
| B             | 0.1%       | 0.0%      | 0.2%     | 1.2%       | 2.6%      | 16.2%    | 43.8%                | 36.0%     |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.4%       | 0.1%      | 0.2%     | 72.0%                | 27.3%     |

**Exhibit 47: One-Year Rating Transition Matrices by Cohort Rating and Sector (1999-2008)**

| <b>Global SF</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
|------------------|------------|-----------|----------|------------|-----------|----------|----------------------|-----------|
| Aaa              | 83.6%      | 0.9%      | 0.7%     | 0.5%       | 0.3%      | 0.2%     | 0.3%                 | 13.5%     |
| Aa               | 4.2%       | 79.5%     | 2.3%     | 1.4%       | 1.1%      | 2.3%     | 2.4%                 | 6.8%      |
| A                | 0.9%       | 3.1%      | 77.9%    | 3.5%       | 1.6%      | 2.3%     | 3.7%                 | 6.9%      |
| Baa              | 0.3%       | 0.4%      | 2.3%     | 76.7%      | 3.4%      | 3.1%     | 7.5%                 | 6.2%      |
| Ba               | 0.1%       | 0.1%      | 0.3%     | 2.0%       | 76.4%     | 3.6%     | 11.2%                | 6.2%      |
| B                | 0.1%       | 0.0%      | 0.1%     | 0.3%       | 1.7%      | 78.0%    | 13.8%                | 5.9%      |
| Caa and below    | 0.0%       | 0.0%      | 0.0%     | 0.1%       | 0.1%      | 0.5%     | 89.4%                | 9.9%      |

| <b>Global SF ex<br/>SFCDOs &amp;<br/>'05-'07 US<br/>HEL &amp; RMBS</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
|--|------------|-----------|----------|------------|-----------|----------|----------------------|-----------|
| Aaa  | 82.6%      | 0.5%      | 0.3%     | 0.2%       | 0.0%      | 0.0%     | 0.0%                 | 16.3%     |
| Aa   | 5.9%       | 81.9%     | 1.7%     | 0.6%       | 0.2%      | 0.1%     | 0.2%                 | 9.3%      |
| A  | 1.2%       | 3.9%      | 82.7%    | 2.5%       | 0.7%      | 0.3%     | 0.3%                 | 8.4%      |
| Baa  | 0.4%       | 0.5%      | 3.0%     | 83.0%      | 2.8%      | 1.5%     | 1.2%                 | 7.6%      |
| Ba   | 0.2%       | 0.1%      | 0.4%     | 2.5%       | 83.3%     | 3.1%     | 3.9%                 | 6.6%      |
| B  | 0.1%       | 0.0%      | 0.1%     | 0.3%       | 1.9%      | 82.4%    | 9.5%                 | 5.7%      |
| Caa and below  | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 0.5%     | 90.7%                | 8.7%      |

| <b>US ABS</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
|---------------|------------|-----------|----------|------------|-----------|----------|----------------------|-----------|
| Aaa           | 79.2%      | 1.3%      | 1.0%     | 0.7%       | 0.2%      | 0.2%     | 0.1%                 | 17.2%     |
| Aa            | 2.0%       | 80.8%     | 2.9%     | 1.8%       | 1.3%      | 2.7%     | 2.9%                 | 5.6%      |
| A             | 0.4%       | 2.0%      | 77.2%    | 5.0%       | 2.0%      | 2.8%     | 3.9%                 | 6.8%      |
| Baa           | 0.1%       | 0.2%      | 0.9%     | 74.1%      | 4.9%      | 4.7%     | 10.3%                | 4.9%      |
| Ba            | 0.0%       | 0.0%      | 0.1%     | 0.6%       | 61.0%     | 6.7%     | 26.4%                | 5.2%      |
| B             | 0.0%       | 0.0%      | 0.0%     | 0.1%       | 0.1%      | 57.1%    | 37.4%                | 5.2%      |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 0.0%     | 88.3%                | 11.6%     |

| <b>US ABS ex<br/>HEL</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
|--------------------------|------------|-----------|----------|------------|-----------|----------|----------------------|-----------|
| Aaa                      | 80.8%      | 1.3%      | 0.9%     | 0.3%       | 0.1%      | 0.0%     | 0.1%                 | 16.5%     |
| Aa                       | 2.8%       | 78.2%     | 4.4%     | 1.8%       | 0.6%      | 0.6%     | 1.1%                 | 10.4%     |
| A                        | 0.7%       | 2.7%      | 78.2%    | 4.3%       | 0.9%      | 0.5%     | 0.5%                 | 12.2%     |
| Baa                      | 0.4%       | 0.4%      | 1.4%     | 81.1%      | 4.3%      | 1.5%     | 2.0%                 | 8.9%      |
| Ba                       | 0.1%       | 0.1%      | 0.2%     | 1.2%       | 73.0%     | 7.0%     | 11.7%                | 6.7%      |
| B                        | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 74.5%    | 22.4%                | 3.1%      |
| Caa and below            | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 0.1%     | 93.0%                | 6.9%      |



**Exhibit 47: One-Year Rating Transition Matrices by Cohort Rating and Sector (1999-2008)**

| <b>US HEL</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
|----------------|------------|-----------|----------|------------|-----------|----------|----------------------|-----------|
| Aaa            | 77.9%      | 1.2%      | 1.0%     | 1.1%       | 0.3%      | 0.3%     | 0.2%                 | 17.9%     |
| Aa             | 1.7%       | 81.7%     | 2.4%     | 1.8%       | 1.5%      | 3.5%     | 3.6%                 | 3.9%      |
| A              | 0.1%       | 1.5%      | 76.5%    | 5.5%       | 2.8%      | 4.4%     | 6.2%                 | 3.0%      |
| Baa            | 0.0%       | 0.1%      | 0.7%     | 71.8%      | 5.1%      | 5.8%     | 13.0%                | 3.6%      |
| Ba             | 0.0%       | 0.0%      | 0.0%     | 0.4%       | 56.1%     | 6.6%     | 32.4%                | 4.6%      |
| B              | 0.0%       | 0.0%      | 0.1%     | 0.1%       | 0.3%      | 41.2%    | 51.1%                | 7.2%      |
| Caa and below  | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 0.0%     | 80.3%                | 19.7%     |
| <b>US RMBS</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa            | 86.5%      | 0.6%      | 0.6%     | 0.4%       | 0.3%      | 0.1%     | 0.0%                 | 11.4%     |
| Aa             | 4.2%       | 78.2%     | 1.7%     | 1.5%       | 1.4%      | 4.2%     | 2.0%                 | 6.7%      |
| A              | 0.8%       | 3.5%      | 73.7%    | 2.9%       | 1.9%      | 5.1%     | 6.2%                 | 5.9%      |
| Baa            | 0.2%       | 0.4%      | 3.3%     | 72.4%      | 2.5%      | 4.2%     | 11.2%                | 5.8%      |
| Ba             | 0.1%       | 0.1%      | 0.7%     | 4.5%       | 76.7%     | 1.7%     | 9.8%                 | 6.4%      |
| B              | 0.0%       | 0.0%      | 0.1%     | 0.4%       | 4.8%      | 80.5%    | 6.6%                 | 7.6%      |
| Caa and below  | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 0.0%     | 91.0%                | 9.0%      |
| <b>US CMBS</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa            | 90.3%      | 0.3%      | 0.0%     | 0.0%       | 0.0%      | 0.0%     | 0.0%                 | 9.4%      |
| Aa             | 18.0%      | 74.7%     | 0.6%     | 0.0%       | 0.0%      | 0.0%     | 0.0%                 | 6.6%      |
| A              | 4.1%       | 10.4%     | 79.0%    | 1.1%       | 0.2%      | 0.0%     | 0.0%                 | 5.2%      |
| Baa            | 0.9%       | 1.2%      | 6.7%     | 82.1%      | 1.6%      | 0.3%     | 0.1%                 | 7.0%      |
| Ba             | 0.3%       | 0.0%      | 0.5%     | 2.8%       | 90.9%     | 2.2%     | 0.3%                 | 3.1%      |
| B              | 0.1%       | 0.0%      | 0.0%     | 0.1%       | 0.8%      | 91.7%    | 5.3%                 | 1.9%      |
| Caa and below  | 0.1%       | 0.0%      | 0.0%     | 0.0%       | 0.1%      | 0.7%     | 92.2%                | 7.0%      |
| <b>US CDO</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa            | 82.4%      | 2.3%      | 1.4%     | 1.1%       | 1.1%      | 1.1%     | 3.8%                 | 6.8%      |
| Aa             | 1.3%       | 77.9%     | 3.5%     | 2.2%       | 1.6%      | 1.2%     | 5.7%                 | 6.5%      |
| A              | 0.6%       | 1.2%      | 79.5%    | 2.9%       | 1.8%      | 1.1%     | 6.7%                 | 6.2%      |
| Baa            | 0.2%       | 0.4%      | 0.6%     | 78.1%      | 3.4%      | 2.5%     | 8.5%                 | 6.3%      |
| Ba             | 0.0%       | 0.1%      | 0.2%     | 0.9%       | 76.9%     | 3.4%     | 10.4%                | 7.9%      |
| B              | 0.0%       | 0.1%      | 0.3%     | 0.8%       | 2.1%      | 61.7%    | 25.7%                | 9.3%      |
| Caa and below  | 0.0%       | 0.0%      | 0.0%     | 0.1%       | 0.2%      | 0.8%     | 92.0%                | 6.9%      |

**Exhibit 48: Global Structured Finance One-Year Refined-Rating Transition Matrix by Cohort Rating in 2008**

|      | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3 | Ba1   | Ba2   | Ba3   | B1   | B2    | B3    | Caa1  | Caa2  | Caa3  | Ca    | C     | WR    |      |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|------|
| Aaa  | 52223 | 69.9% | 1.8%  | 1.9%  | 3.4%  | 2.6%  | 2.1%  | 1.5%  | 2.8%  | 1.2%  | 1.2% | 0.9%  | 1.2%  | 0.7%  | 0.5% | 0.6%  | 0.7%  | 0.6%  | 0.3%  | 0.5%  | 0.7%  | 0.4%  | 4.5%  |      |
| Aa1  | 4495  | 1.3%  | 47.8% | 1.6%  | 2.2%  | 3.2%  | 2.6%  | 2.6%  | 2.5%  | 2.4%  | 2.4% | 2.1%  | 2.2%  | 3.3%  | 2.8% | 2.7%  | 4.3%  | 1.6%  | 2.4%  | 0.9%  | 2.6%  | 4.0%  | 2.1%  |      |
| Aa2  | 7032  | 0.8%  | 0.5%  | 55.0% | 2.9%  | 2.5%  | 2.4%  | 1.7%  | 1.6%  | 1.6%  | 1.2% | 1.4%  | 1.0%  | 1.1%  | 1.5% | 2.1%  | 3.0%  | 1.2%  | 2.1%  | 1.9%  | 5.2%  | 6.5%  | 2.9%  |      |
| Aa3  | 3403  | 0.6%  | 0.5%  | 1.0%  | 42.3% | 1.9%  | 2.3%  | 2.8%  | 2.5%  | 2.1%  | 1.6% | 1.4%  | 1.1%  | 1.4%  | 2.0% | 2.4%  | 3.9%  | 1.4%  | 2.5%  | 2.1%  | 5.7%  | 15.0% | 3.8%  |      |
| A1   | 2290  | 0.4%  | 0.2%  | 0.7%  | 0.9%  | 46.8% | 2.0%  | 2.7%  | 3.8%  | 2.6%  | 1.9% | 1.8%  | 1.9%  | 1.3%  | 1.5% | 2.3%  | 3.6%  | 1.1%  | 3.1%  | 1.4%  | 5.7%  | 9.1%  | 5.1%  |      |
| A2   | 6495  | 0.1%  | 0.1%  | 0.3%  | 0.3%  | 0.6%  | 60.7% | 1.1%  | 2.5%  | 3.2%  | 1.5% | 1.4%  | 1.0%  | 1.5%  | 1.2% | 1.8%  | 2.8%  | 1.4%  | 1.5%  | 1.6%  | 5.1%  | 6.7%  | 3.7%  |      |
| A3   | 3230  | 0.1%  | 0.1%  | 0.2%  | 0.3%  | 0.4%  | 0.6%  | 43.9% | 2.3%  | 2.7%  | 3.2% | 2.5%  | 1.8%  | 2.0%  | 2.3% | 1.9%  | 2.8%  | 1.6%  | 2.8%  | 2.3%  | 8.5%  | 15.1% | 2.9%  |      |
| Baa1 | 2884  | 0.0%  |       | 0.1%  | 0.1%  | 0.4%  | 0.6%  | 0.8%  | 46.2% | 1.6%  | 1.9% | 2.8%  | 1.7%  | 1.8%  | 2.2% | 2.3%  | 2.6%  | 1.8%  | 2.5%  | 1.4%  | 8.7%  | 18.1% | 2.4%  |      |
| Baa2 | 5883  | 0.1%  |       |       | 0.0%  | 0.1%  | 0.3%  | 0.2%  | 0.5%  | 54.2% | 1.2% | 2.0%  | 2.3%  | 1.1%  | 1.5% | 1.7%  | 2.7%  | 1.5%  | 1.7%  | 1.4%  | 8.2%  | 15.0% | 4.2%  |      |
| Baa3 | 3640  |       |       |       |       |       |       | 0.1%  | 0.2%  | 0.2%  | 0.6% | 48.1% | 1.2%  | 1.7%  | 1.9% | 1.6%  | 1.6%  | 2.8%  | 1.3%  | 1.5%  | 1.5%  | 10.3% | 22.4% | 3.1% |
| Ba1  | 1822  | 0.1%  |       |       |       |       | 0.1%  | 0.1%  | 0.3%  | 0.4%  | 0.3% | 42.2% | 1.2%  | 0.9%  | 0.8% | 1.0%  | 1.8%  | 0.9%  | 1.2%  | 1.3%  | 11.3% | 32.7% | 3.6%  |      |
| Ba2  | 2659  |       |       | 0.0%  |       |       |       |       | 0.0%  | 0.3%  | 0.2% | 0.3%  | 56.8% | 0.8%  | 0.9% | 1.2%  | 1.4%  | 0.9%  | 1.5%  | 1.4%  | 9.4%  | 21.6% | 3.3%  |      |
| Ba3  | 1371  |       |       |       |       |       |       | 0.1%  |       | 0.1%  | 0.3% | 0.3%  | 0.3%  | 50.5% | 1.5% | 1.2%  | 2.0%  | 0.6%  | 0.5%  | 0.4%  | 8.5%  | 31.0% | 2.9%  |      |
| B1   | 883   |       |       |       |       |       |       |       |       | 0.3%  |      |       |       |       | 0.1% | 43.8% | 2.4%  | 1.0%  | 1.5%  | 0.8%  | 0.6%  | 8.7%  | 36.5% | 4.3% |
| B2   | 1114  |       |       |       |       |       |       |       |       |       |      |       | 0.5%  |       | 0.3% | 53.3% | 2.1%  | 2.7%  | 1.2%  | 0.7%  | 10.3% | 26.8% | 2.1%  |      |
| B3   | 1293  |       |       |       |       |       |       |       |       |       |      |       |       |       |      | 0.1%  | 32.0% | 2.0%  | 2.0%  | 1.3%  | 8.2%  | 51.0% | 3.3%  |      |
| Caa1 | 439   |       |       |       |       |       |       |       |       |       |      |       |       |       | 0.2% |       |       | 36.0% | 0.9%  | 2.3%  | 8.7%  | 47.4% | 4.6%  |      |
| Caa2 | 478   |       |       |       |       |       |       |       |       |       |      |       |       |       |      |       | 0.6%  |       | 29.7% | 1.7%  | 10.7% | 50.4% | 6.9%  |      |
| Caa3 | 413   |       |       |       |       |       |       |       |       |       |      |       |       |       | 0.2% |       |       |       |       | 26.2% | 13.1% | 49.9% | 10.7% |      |
| Ca   | 959   |       |       |       |       |       |       |       |       |       |      |       |       |       |      |       |       |       |       |       | 33.8% | 52.0% | 14.2% |      |
| C    | 1477  |       |       |       |       |       |       |       |       |       |      |       |       |       |      |       |       |       |       |       |       | 75.6% | 24.4% |      |

**Exhibit 49: Global Structured Finance excluding SFCDOs & 2005-2007 US RMBS & HEL One-Year Refined-Rating Transition Matrix by Cohort Rating in 2008**

|      | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1   | B2    | B3    | Caa1 | Caa2  | Caa3  | Ca    | C     | WR   |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|------|-------|-------|-------|-------|------|
| Aaa  | 26453 | 83.7% | 0.7%  | 0.8%  | 2.6%  | 0.7%  | 1.4%  | 0.4%  | 1.8%  | 0.4%  | 0.4%  | 0.1%  | 0.0%  | 0.0%  | 0.1% | 0.1%  | 0.1%  | 0.1% | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 6.5% |
| Aa1  | 1320  | 4.5%  | 82.0% | 0.6%  | 1.2%  | 1.1%  | 1.3%  | 0.5%  | 0.4%  | 0.4%  | 0.7%  |       | 0.7%  | 1.0%  | 0.1% |       | 0.1%  | 0.1% | 0.1%  |       |       | 0.2%  | 5.2% |
| Aa2  | 3945  | 1.3%  | 0.9%  | 80.3% | 3.8%  | 1.7%  | 1.0%  | 1.3%  | 0.9%  | 0.7%  | 0.7%  | 0.5%  | 0.4%  | 0.3%  | 0.3% | 0.4%  | 0.2%  | 0.5% | 0.2%  | 0.3%  | 0.1%  |       | 4.3% |
| Aa3  | 1526  | 1.2%  | 1.0%  | 2.2%  | 73.7% | 1.4%  | 1.4%  | 1.8%  | 1.4%  | 1.8%  | 0.5%  | 0.9%  | 0.7%  | 0.7%  | 0.1% | 0.5%  | 0.7%  | 0.7% | 0.4%  | 0.9%  | 0.1%  | 0.1%  | 7.9% |
| A1   | 1175  | 0.9%  | 0.3%  | 1.4%  | 1.8%  | 74.3% | 1.3%  | 2.6%  | 2.0%  | 1.6%  | 0.7%  | 0.7%  | 0.6%  | 0.4%  | 0.3% | 0.3%  | 0.8%  | 0.1% | 0.3%  | 0.3%  | 0.6%  |       | 8.9% |
| A2   | 4400  | 0.2%  | 0.1%  | 0.4%  | 0.4%  | 0.9%  | 80.6% | 1.0%  | 1.9%  | 1.9%  | 1.1%  | 0.6%  | 0.7%  | 0.9%  | 0.5% | 0.5%  | 1.0%  | 0.7% | 0.4%  | 0.6%  | 0.8%  | 0.1%  | 4.9% |
| A3   | 1650  | 0.2%  | 0.1%  | 0.3%  | 0.6%  | 0.8%  | 1.2%  | 73.9% | 2.0%  | 3.0%  | 2.8%  | 2.5%  | 1.0%  | 0.7%  | 1.4% | 0.7%  | 1.0%  | 0.8% | 0.6%  | 0.8%  | 1.0%  | 0.4%  | 3.9% |
| Baa1 | 1532  | 0.1%  |       | 0.1%  | 0.1%  | 0.7%  | 1.2%  | 1.5%  | 77.9% | 1.3%  | 2.2%  | 1.8%  | 1.6%  | 1.5%  | 1.3% | 0.9%  | 0.4%  | 0.5% | 0.7%  | 0.3%  | 0.9%  | 1.0%  | 3.9% |
| Baa2 | 3715  | 0.2%  |       |       | 0.1%  | 0.2%  | 0.4%  | 0.3%  | 0.8%  | 77.6% | 1.5%  | 2.4%  | 2.3%  | 0.9%  | 0.9% | 0.9%  | 1.6%  | 0.6% | 0.7%  | 0.4%  | 1.7%  | 0.6%  | 5.9% |
| Baa3 | 2058  |       |       |       |       |       | 0.1%  | 0.3%  | 0.4%  | 1.1%  | 79.1% | 1.8%  | 2.0%  | 2.0%  | 1.5% | 1.0%  | 1.7%  | 0.6% | 0.8%  | 0.7%  | 1.9%  | 1.0%  | 3.9% |
| Ba1  | 926   | 0.2%  |       |       |       |       | 0.1%  | 0.1%  | 0.5%  | 0.9%  | 0.5%  | 79.6% | 2.2%  | 1.3%  | 1.0% | 1.1%  | 2.4%  | 0.6% | 0.5%  | 0.3%  | 1.5%  | 1.6%  | 5.5% |
| Ba2  | 1716  |       |       | 0.1%  |       |       |       |       | 0.1%  | 0.5%  | 0.3%  | 0.5%  | 82.1% | 1.2%  | 1.3% | 1.1%  | 1.7%  | 0.9% | 0.9%  | 1.5%  | 2.9%  | 1.0%  | 4.0% |
| Ba3  | 804   |       |       |       |       |       |       | 0.1%  |       | 0.1%  | 0.5%  | 0.5%  | 0.5%  | 83.1% | 2.2% | 2.0%  | 2.7%  | 1.0% | 0.5%  | 0.4%  | 2.4%  | 1.1%  | 2.9% |
| B1   | 475   |       |       |       |       |       |       |       |       | 0.6%  |       |       |       |       | 0.2% | 81.3% | 4.4%  | 1.9% | 2.5%  | 0.8%  | 1.1%  | 2.1%  | 4.0% |
| B2   | 645   |       |       |       |       |       |       |       |       |       |       |       | 0.9%  |       | 0.5% | 80.0% | 3.6%  | 4.0% | 1.9%  | 0.8%  | 2.6%  | 3.4%  | 2.3% |
| B3   | 495   |       |       |       |       |       |       |       |       |       |       |       |       |       |      | 0.2%  | 81.8% | 5.3% | 4.4%  | 2.6%  | 2.4%  | 1.8%  | 1.4% |
| Caa1 | 209   |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       | 0.5%  |      | 73.7% | 1.4%  | 4.8%  | 5.7%  | 4.3% |
| Caa2 | 180   |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       | 1.7% |       | 76.1% | 4.4%  | 8.3%  | 3.3% |
| Caa3 | 132   |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       | 0.8%  |      |       | 78.0% | 5.3%  | 10.6% | 5.3% |
| Ca   | 323   |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |      |       |       | 84.8% | 9.0%  | 6.2% |
| C    | 486   |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |      |       |       |       | 92.0% | 8.0% |

## Exhibit 50: US ABS One-Year Refined-Rating Transition Matrix by Cohort Rating in 2008

|      | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1  | Caa2  | Caa3  | Ca    | C     | WR    |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Aaa  | 12861 | 62.0% | 1.0%  | 1.8%  | 5.4%  | 1.9%  | 3.1%  | 1.4%  | 5.8%  | 1.4%  | 1.3%  | 1.1%  | 0.7%  | 0.8%  | 0.6%  | 0.9%  | 1.2%  | 1.6%  | 0.8%  | 0.3%  | 0.3%  | 0.1%  | 6.4%  |
| Aa1  | 1382  | 0.2%  | 50.5% | 0.7%  | 0.8%  | 2.1%  | 1.7%  | 0.9%  | 2.8%  | 2.3%  | 1.1%  | 3.0%  | 2.2%  | 1.7%  | 2.2%  | 1.5%  | 2.1%  | 0.9%  | 5.4%  | 0.9%  | 4.1%  | 11.4% | 1.4%  |
| Aa2  | 2281  | 0.2%  | 0.2%  | 56.2% | 1.3%  | 3.5%  | 2.2%  | 1.5%  | 1.4%  | 1.5%  | 0.9%  | 1.8%  | 0.8%  | 1.0%  | 1.0%  | 1.5%  | 1.1%  | 0.5%  | 3.7%  | 0.9%  | 2.8%  | 14.7% | 1.1%  |
| Aa3  | 1433  | 0.1%  | 0.3%  | 0.2%  | 36.7% | 2.9%  | 3.3%  | 2.3%  | 3.4%  | 2.5%  | 1.3%  | 1.1%  | 1.0%  | 1.3%  | 1.4%  | 2.3%  | 1.1%  | 0.3%  | 3.8%  | 0.5%  | 2.3%  | 30.4% | 1.3%  |
| A1   | 1006  |       |       | 0.2%  |       | 44.1% | 2.7%  | 3.6%  | 5.5%  | 4.4%  | 2.2%  | 2.7%  | 2.2%  | 1.5%  | 1.5%  | 1.5%  | 1.8%  | 0.2%  | 4.8%  | 0.6%  | 2.7%  | 16.1% | 1.9%  |
| A2   | 2319  |       | 0.0%  | 0.0%  | 0.3%  | 0.2%  | 60.8% | 0.9%  | 3.5%  | 3.8%  | 2.5%  | 2.0%  | 0.9%  | 1.1%  | 0.9%  | 1.8%  | 2.0%  | 1.4%  | 2.1%  | 0.6%  | 1.5%  | 11.0% | 2.6%  |
| A3   | 1371  |       | 0.1%  |       | 0.1%  |       |       | 37.6% | 3.0%  | 3.8%  | 4.6%  | 4.0%  | 2.6%  | 2.6%  | 2.2%  | 1.8%  | 1.8%  | 0.4%  | 4.8%  | 0.9%  | 3.4%  | 24.7% | 1.5%  |
| Baa1 | 1410  |       |       |       |       |       |       |       | 40.0% | 1.9%  | 2.7%  | 3.8%  | 2.6%  | 2.9%  | 2.6%  | 2.6%  | 1.8%  | 1.8%  | 4.0%  | 1.4%  | 3.3%  | 28.0% | 0.5%  |
| Baa2 | 1815  |       |       |       |       |       |       |       |       | 44.1% | 0.7%  | 2.8%  | 3.0%  | 1.7%  | 1.9%  | 2.3%  | 3.1%  | 1.3%  | 3.5%  | 1.5%  | 3.5%  | 28.0% | 2.7%  |
| Baa3 | 1513  |       |       |       |       |       |       |       |       |       | 36.9% | 0.8%  | 1.7%  | 2.2%  | 2.2%  | 1.7%  | 2.8%  | 1.3%  | 2.6%  | 1.8%  | 6.7%  | 37.3% | 1.9%  |
| Ba1  | 772   |       |       |       |       |       |       |       |       |       |       | 25.1% | 0.3%  | 0.8%  | 0.9%  | 0.6%  | 2.5%  | 1.4%  | 2.3%  | 1.2%  | 6.6%  | 57.0% | 1.3%  |
| Ba2  | 703   |       |       |       |       |       |       |       |       |       |       |       | 26.7% |       | 1.4%  | 0.3%  | 1.4%  | 2.0%  | 2.4%  | 2.7%  | 5.4%  | 55.3% | 2.3%  |
| Ba3  | 414   |       |       |       |       |       |       |       |       |       |       |       |       | 27.8% |       | 0.5%  | 2.4%  | 0.2%  | 1.0%  | 0.7%  | 3.1%  | 63.0% | 1.2%  |
| B1   | 337   |       |       |       |       |       |       |       |       |       |       |       |       |       | 26.4% |       | 0.3%  | 0.6%  | 1.2%  | 0.6%  | 3.6%  | 65.6% | 1.8%  |
| B2   | 329   |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 30.7% |       | 2.7%  | 0.9%  | 0.6%  | 3.0%  | 61.1% | 0.9%  |
| B3   | 732   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 17.1% | 0.1%  | 0.7%  | 1.2%  | 2.6%  | 76.1% | 2.2%  |
| Caa1 | 228   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 36.0% |       | 2.6%  | 1.3%  | 57.5% | 2.6%  |
| Caa2 | 278   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 30.6% |       | 2.2%  | 61.2% | 6.1%  |
| Caa3 | 181   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 28.7% | 2.2%  | 59.7% | 9.4%  |
| Ca   | 514   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 26.3% | 61.3% | 12.5% |
| C    | 1201  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 71.8% | 28.2% |

**Exhibit 51: US ABS ex HEL One-Year Refined-Rating Transition Matrix by Cohort Rating in 2008**

|      | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1  | Caa2  | Caa3  | Ca    | C     | WR   |       |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|
| Aaa  | 4717  | 69.7% | 0.1%  | 0.5%  | 10.0% | 1.8%  | 4.7%  | 0.8%  | 3.1%  | 0.6%  | 1.0%  | 0.0%  |       | 0.0%  | 0.0%  |       |       |       |       |       |       |       | 7.6% |       |
| Aa1  | 174   | 1.7%  | 92.5% |       |       |       | 0.6%  |       |       |       |       |       | 0.6%  |       |       |       |       |       |       |       |       |       |      | 4.6%  |
| Aa2  | 243   | 0.4%  | 0.8%  | 91.8% |       | 0.4%  |       | 1.6%  |       | 0.4%  |       |       |       |       |       |       |       |       |       |       |       |       |      | 4.5%  |
| Aa3  | 181   | 1.1%  |       | 1.7%  | 81.8% | 1.1%  |       | 0.6%  | 1.1%  | 1.1%  |       |       | 1.1%  |       |       |       |       |       |       |       |       |       |      | 10.5% |
| A1   | 170   |       |       | 1.2%  |       | 86.5% | 0.6%  | 0.6%  |       | 0.6%  | 0.6%  |       |       |       |       |       | 0.6%  |       |       |       |       |       |      | 9.4%  |
| A2   | 739   |       | 0.1%  | 0.1%  | 0.3%  | 0.4%  | 85.7% | 0.3%  |       | 0.1%  | 0.8%  |       |       | 0.1%  | 0.4%  | 0.3%  | 1.5%  | 2.7%  |       |       |       |       |      | 7.2%  |
| A3   | 138   |       | 0.7%  |       | 0.7%  |       |       | 89.9% |       |       |       |       | 1.4%  |       | 2.9%  | 2.2%  | 0.7%  |       |       |       |       |       |      | 1.4%  |
| Baa1 | 190   |       |       |       |       |       |       |       | 95.8% |       |       | 1.1%  | 0.5%  |       |       |       |       |       |       |       |       |       |      | 2.6%  |
| Baa2 | 359   |       |       |       |       |       |       |       |       | 82.5% | 0.3%  | 1.4%  | 3.9%  |       |       | 1.1%  | 1.4%  |       |       |       |       |       |      | 9.5%  |
| Baa3 | 314   |       |       |       |       |       |       |       |       |       | 95.2% |       | 0.3%  |       | 0.3%  | 0.3%  | 0.3%  |       |       | 0.3%  |       |       |      | 3.2%  |
| Ba1  | 111   |       |       |       |       |       |       |       |       |       |       | 95.5% |       |       |       |       |       |       |       |       |       |       |      | 4.5%  |
| Ba2  | 77    |       |       |       |       |       |       |       |       |       |       |       | 84.4% |       | 6.5%  |       |       |       |       |       |       | 1.3%  |      | 7.8%  |
| Ba3  | 45    |       |       |       |       |       |       |       |       |       |       |       |       | 91.1% |       |       | 4.4%  |       |       |       |       | 4.4%  |      |       |
| B1   | 38    |       |       |       |       |       |       |       |       |       |       |       |       |       | 94.7% |       |       |       |       |       |       |       |      | 5.3%  |
| B2   | 45    |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 80.0% |       | 8.9%  | 2.2%  | 2.2%  | 2.2%  |       |      | 4.4%  |
| B3   | 51    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 98.0% |       |       |       |       |       |      | 2.0%  |
| Caa1 | 41    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 87.8% |       | 7.3%  |       | 2.4%  |      | 2.4%  |
| Caa2 | 29    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 96.6% |       |       |       |      | 3.4%  |
| Caa3 | 27    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 88.9% |       |       |      | 11.1% |
| Ca   | 98    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 89.8% | 1.0%  |      | 9.2%  |
| C    | 247   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 92.7% |      | 7.3%  |

## Exhibit 52: US HEL One-Year Refined-Rating Transition Matrix by Cohort Rating in 2008

|      | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3  | B1    | B2    | B3    | Caa1  | Caa2  | Caa3  | Ca    | C     | WR    |      |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|
| Aaa  | 8144  | 57.6% | 1.5%  | 2.6%  | 2.8%  | 2.0%  | 2.2%  | 1.7%  | 7.5%  | 1.9%  | 1.5%  | 1.7%  | 1.1%  | 1.2% | 1.0%  | 1.4%  | 1.9%  | 2.5%  | 1.2%  | 0.5%  | 0.4%  | 0.1%  | 5.6%  |      |
| Aa1  | 1208  |       | 44.5% | 0.8%  | 0.9%  | 2.4%  | 1.8%  | 1.1%  | 3.2%  | 2.6%  | 1.2%  | 3.4%  | 2.5%  | 2.0% | 2.5%  | 1.7%  | 2.4%  | 1.0%  | 6.2%  | 1.1%  | 4.6%  | 13.1% | 0.9%  |      |
| Aa2  | 2038  | 0.2%  | 0.1%  | 52.0% | 1.4%  | 3.9%  | 2.5%  | 1.5%  | 1.6%  | 1.7%  | 1.0%  | 2.0%  | 0.9%  | 1.1% | 1.1%  | 1.7%  | 1.2%  | 0.5%  | 4.2%  | 1.0%  | 3.2%  | 16.5% | 0.7%  |      |
| Aa3  | 1252  |       | 0.3%  |       | 30.2% | 3.1%  | 3.8%  | 2.6%  | 3.8%  | 2.7%  | 1.4%  | 1.3%  | 1.0%  | 1.5% | 1.6%  | 2.6%  | 1.3%  | 0.4%  | 4.4%  | 0.6%  | 2.6%  | 34.8% |       |      |
| A1   | 836   |       |       |       |       | 35.5% | 3.1%  | 4.2%  | 6.6%  | 5.1%  | 2.5%  | 3.2%  | 2.6%  | 1.8% | 1.8%  | 1.8%  | 2.0%  | 0.2%  | 5.7%  | 0.7%  | 3.2%  | 19.4% | 0.4%  |      |
| A2   | 1580  |       |       |       | 0.3%  | 0.1%  | 49.2% | 1.3%  | 5.2%  | 5.5%  | 3.3%  | 2.9%  | 1.4%  | 1.5% | 1.1%  | 2.5%  | 2.2%  | 0.8%  | 3.0%  | 0.8%  | 2.2%  | 16.1% | 0.4%  |      |
| A3   | 1233  |       |       |       |       |       |       | 31.8% | 3.3%  | 4.2%  | 5.1%  | 4.5%  | 2.7%  | 2.9% | 2.1%  | 1.8%  | 1.9%  | 0.4%  | 5.4%  | 1.1%  | 3.8%  | 27.5% | 1.5%  |      |
| Baa1 | 1220  |       |       |       |       |       |       |       | 31.3% | 2.2%  | 3.1%  | 4.3%  | 2.9%  | 3.4% | 3.0%  | 3.0%  | 2.1%  | 2.1%  | 4.6%  | 1.6%  | 3.9%  | 32.4% | 0.2%  |      |
| Baa2 | 1456  |       |       |       |       |       |       |       |       | 34.6% | 0.8%  | 3.1%  | 2.7%  | 2.1% | 2.3%  | 2.5%  | 3.6%  | 1.6%  | 4.4%  | 1.9%  | 4.3%  | 35.0% | 1.0%  |      |
| Baa3 | 1199  |       |       |       |       |       |       |       |       |       | 21.6% | 1.0%  | 2.1%  | 2.8% | 2.8%  | 2.1%  | 3.5%  | 1.7%  | 3.2%  | 2.3%  | 8.5%  | 47.0% | 1.6%  |      |
| Ba1  | 661   |       |       |       |       |       |       |       |       |       |       | 13.3% | 0.3%  | 0.9% | 1.1%  | 0.8%  | 2.9%  | 1.7%  | 2.7%  | 1.4%  | 7.7%  | 66.6% | 0.8%  |      |
| Ba2  | 626   |       |       |       |       |       |       |       |       |       |       |       | 19.6% |      | 0.8%  | 0.3%  | 1.6%  | 2.2%  | 2.7%  | 2.9%  | 6.1%  | 62.1% | 1.6%  |      |
| Ba3  | 369   |       |       |       |       |       |       |       |       |       |       |       |       |      |       | 20.1% | 0.5%  | 2.2%  | 0.3%  | 1.1%  | 0.8%  | 3.0%  | 70.7% | 1.4% |
| B1   | 299   |       |       |       |       |       |       |       |       |       |       |       |       |      | 17.7% |       | 0.3%  | 0.7%  | 1.3%  | 0.7%  | 4.0%  | 73.9% | 1.3%  |      |
| B2   | 284   |       |       |       |       |       |       |       |       |       |       |       |       |      |       | 22.9% |       | 1.8%  | 0.7%  | 0.4%  | 3.2%  | 70.8% | 0.4%  |      |
| B3   | 681   |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       | 11.0% | 0.1%  | 0.7%  | 1.3%  | 2.8%  | 81.8% | 2.2%  |      |
| Caa1 | 187   |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       | 24.6% |       | 1.6%  | 1.6%  | 69.5% | 2.7%  |      |
| Caa2 | 249   |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |       | 22.9% |       | 2.4%  | 68.3% | 6.4%  |      |
| Caa3 | 154   |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |       |       | 18.2% | 2.6%  | 70.1% | 9.1%  |      |
| Ca   | 416   |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |       |       |       | 11.3% | 75.5% | 13.2% |      |
| C    | 954   |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |       |       |       |       | 66.4% | 33.6% |      |

## Exhibit 53 US RMBS One-Year Refined-Rating Transition Matrix by Cohort Rating in 2008

|      | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3  | B1    | B2    | B3    | Caa1  | Caa2  | Caa3  | Ca    | C     | WR    |     |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----|
| Aaa  | 26856 | 73.0% | 2.5%  | 2.2%  | 3.0%  | 3.8%  | 2.2%  | 2.0%  | 2.2%  | 1.4%  | 1.5%  | 1.1%  | 1.7%  | 0.9% | 0.4%  | 0.4%  | 0.5%  | 0.2%  | 0.1%  | 0.1%  | 0.0%  |       | 26856 |     |
| Aa1  | 2239  |       | 40.6% | 2.4%  | 3.6%  | 3.5%  | 3.7%  | 4.3%  | 2.9%  | 3.0%  | 3.5%  | 2.4%  | 2.6%  | 4.8% | 4.2%  | 4.4%  | 7.0%  | 2.5%  | 1.3%  | 0.7%  | 2.3%  | 0.3%  | 2239  |     |
| Aa2  | 1844  |       |       | 42.7% | 2.4%  | 3.9%  | 2.3%  | 2.8%  | 3.3%  | 2.6%  | 1.7%  | 1.6%  | 1.5%  | 2.0% | 3.0%  | 4.8%  | 9.1%  | 2.3%  | 2.4%  | 1.7%  | 8.2%  | 1.6%  | 1844  |     |
| Aa3  | 764   |       |       |       | 25.9% | 1.4%  | 2.9%  | 2.7%  | 2.4%  | 2.1%  | 3.0%  | 2.0%  | 1.8%  | 1.7% | 5.1%  | 5.4%  | 13.1% | 3.7%  | 2.9%  | 3.1%  | 15.4% | 5.1%  | 764   |     |
| A1   | 449   |       |       |       |       | 26.3% | 1.8%  | 1.8%  | 1.6%  | 1.6%  | 2.9%  | 1.1%  | 3.8%  | 1.6% | 3.8%  | 8.2%  | 12.7% | 4.5%  | 3.8%  | 2.2%  | 17.8% | 4.5%  | 449   |     |
| A2   | 1373  |       |       |       |       |       | 44.9% | 1.6%  | 3.1%  | 2.5%  | 2.1%  | 2.8%  | 1.6%  | 3.1% | 3.1%  | 3.9%  | 7.7%  | 3.1%  | 2.3%  | 1.7%  | 13.2% | 2.9%  | 1373  |     |
| A3   | 657   |       |       |       |       |       |       | 29.2% | 1.4%  | 1.1%  | 1.2%  | 1.7%  | 2.3%  | 3.3% | 3.8%  | 4.3%  | 8.4%  | 4.7%  | 2.6%  | 1.8%  | 25.6% | 8.5%  | 657   |     |
| Baa1 | 537   |       |       |       |       |       |       |       | 20.3% | 0.9%  | 1.7%  | 1.3%  | 0.9%  | 0.9% | 3.5%  | 4.3%  | 8.8%  | 5.0%  | 2.4%  | 1.7%  | 32.8% | 15.5% | 537   |     |
| Baa2 | 1279  |       |       |       |       |       |       |       |       | 41.4% | 1.1%  | 2.0%  | 1.4%  | 1.4% | 2.3%  | 2.3%  | 6.1%  | 3.6%  | 1.9%  | 1.8%  | 23.6% | 10.8% | 1279  |     |
| Baa3 | 668   |       |       |       |       |       |       |       |       |       | 24.6% | 0.6%  | 1.2%  | 1.3% | 1.9%  | 3.3%  | 6.9%  | 4.2%  | 1.0%  | 1.6%  | 31.4% | 21.6% | 668   |     |
| Ba1  | 281   |       |       |       |       |       |       |       |       |       |       | 22.4% | 0.4%  |      |       |       | 1.8%  | 2.1%  | 1.8%  | 1.1%  | 0.4%  | 42.0% | 28.1% | 281 |
| Ba2  | 528   |       |       |       |       |       |       |       |       | 0.4%  |       |       | 43.4% | 0.4% | 0.6%  | 0.6%  | 1.1%  | 0.8%  | 2.3%  | 1.7%  | 31.8% | 16.7% | 528   |     |
| Ba3  | 189   |       |       |       |       |       |       |       |       |       | 1.1%  |       |       |      | 25.9% | 1.1%  | 1.1%  |       |       | 0.5%  |       | 41.3% | 29.1% | 189 |
| B1   | 116   |       |       |       |       |       |       |       |       |       |       |       |       |      | 15.5% |       |       | 1.7%  |       | 0.9%  | 45.7% | 35.3% | 116   |     |
| B2   | 320   |       |       |       |       |       |       |       |       |       |       |       | 0.3%  |      |       | 50.3% |       | 0.3%  |       | 1.6%  | 27.5% | 19.7% | 320   |     |
| B3   | 160   |       |       |       |       |       |       |       |       |       |       |       |       |      |       | 0.6%  | 13.8% |       |       |       | 43.8% | 41.3% | 160   |     |
| Caa1 | 71    |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       | 31.0% |       |       | 21.1% | 47.9% | 71    |     |
| Caa2 | 57    |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |       | 14.0% |       | 35.1% | 50.9% | 57    |     |
| Caa3 | 50    |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |       |       | 18.0% | 34.0% | 46.0% | 50    |     |
| Ca   | 60    |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |       |       |       | 51.7% | 46.7% | 60    |     |
| C    | 53    |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       |       |       |       |       | 92.5% | 53    |     |

**Exhibit 54: US CMBS One-Year Refined-Rating Transition Matrix by Cohort Rating in 2008**

|      | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3  | B1    | B2    | B3   | Caa1  | Caa2  | Caa3  | Ca    | C     | WR   |      |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|------|-------|-------|-------|-------|-------|------|------|
| Aaa  | 3726  | 93.5% | 0.1%  | 0.0%  | 0.0%  |       |       |       |       |       |       |       |       |      |       |       |      |       |       |       |       |       | 6.4% |      |
| Aa1  | 239   | 20.5% | 75.7% | 0.8%  | 0.8%  | 0.4%  |       |       |       |       |       |       |       |      |       |       |      |       |       |       |       |       |      | 1.7% |
| Aa2  | 460   | 7.8%  | 5.2%  | 83.3% | 0.4%  | 0.9%  | 0.2%  | 0.2%  |       |       |       |       |       |      |       |       |      |       |       |       |       |       |      | 2.0% |
| Aa3  | 304   | 4.9%  | 2.6%  | 8.9%  | 79.9% | 0.3%  | 0.7%  | 0.3%  |       |       |       | 0.3%  |       |      |       |       |      | 0.3%  |       |       |       |       |      | 1.6% |
| A1   | 253   | 3.2%  | 1.2%  | 4.3%  | 6.3%  | 78.3% | 1.2%  |       | 1.2%  | 0.4%  |       |       | 0.4%  |      |       |       |      |       |       | 0.4%  |       |       |      | 3.2% |
| A2   | 440   | 0.2%  |       | 1.6%  | 2.0%  | 5.7%  | 84.5% | 2.3%  | 0.7%  | 0.7%  | 0.2%  |       | 0.2%  | 0.2% |       |       |      |       |       |       | 0.2%  |       |      | 1.4% |
| A3   | 395   | 0.5%  | 0.3%  | 0.3%  | 1.8%  | 2.3%  | 4.3%  | 86.1% | 1.5%  | 0.5%  | 0.5%  | 0.5%  |       |      | 0.3%  |       |      |       |       |       |       | 0.3%  |      | 1.0% |
| Baa1 | 434   |       |       | 0.2%  | 0.5%  | 2.5%  | 3.0%  | 3.9%  | 84.1% | 1.6%  | 0.9%  | 0.5%  | 0.5%  | 0.5% |       | 0.2%  |      |       |       |       |       | 0.2%  |      | 1.4% |
| Baa2 | 502   |       |       |       | 0.4%  | 0.6%  | 2.2%  | 1.6%  | 3.4%  | 84.5% | 1.8%  | 1.2%  | 1.2%  |      |       | 1.0%  | 0.6% |       |       |       |       | 0.2%  |      | 1.4% |
| Baa3 | 542   |       |       |       |       |       | 0.2%  | 1.3%  | 1.1%  | 3.1%  | 85.6% | 2.4%  | 1.3%  | 1.7% | 0.4%  | 0.2%  | 0.4% |       |       |       |       | 0.2%  |      | 2.2% |
| Ba1  | 374   |       |       |       |       |       | 0.3%  | 0.3%  | 1.3%  | 1.9%  | 0.8%  | 86.6% | 3.5%  | 2.7% | 0.5%  | 0.8%  | 0.5% | 0.3%  |       |       |       |       |      | 0.5% |
| Ba2  | 409   |       |       |       |       |       |       |       | 0.7%  | 0.5%  | 1.2%  | 89.2% | 3.4%  | 2.0% | 1.0%  | 1.0%  | 1.0% | 0.5%  | 0.2%  |       |       |       |      | 0.2% |
| Ba3  | 346   |       |       |       |       |       |       | 0.3%  | 0.3%  | 0.3%  | 0.6%  | 0.3%  | 90.2% | 3.8% | 2.3%  | 0.9%  | 0.6% | 0.3%  |       |       |       |       |      | 0.3% |
| B1   | 282   |       |       |       |       |       |       |       |       |       |       |       |       | 0.4% | 85.5% | 7.4%  | 2.8% | 2.8%  | 0.4%  | 0.4%  |       |       |      | 0.4% |
| B2   | 321   |       |       |       |       |       |       |       |       |       |       |       |       | 0.6% | 83.8% | 6.5%  | 5.6% | 2.5%  | 0.3%  | 0.3%  |       |       |      | 0.3% |
| B3   | 290   |       |       |       |       |       |       |       |       |       |       |       |       |      |       | 83.4% | 7.9% | 5.9%  | 2.1%  | 0.3%  |       |       |      | 0.3% |
| Caa1 | 39    |       |       |       |       |       |       |       |       |       |       |       |       |      | 2.6%  |       |      | 69.2% | 5.1%  | 10.3% | 10.3% | 2.6%  |      |      |
| Caa2 | 42    |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       | 2.4% |       | 76.2% | 14.3% | 7.1%  |       |      |      |
| Caa3 | 21    |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |      |       |       | 85.7% | 9.5%  |       |      | 4.8% |
| Ca   | 25    |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |      |       |       |       | 84.0% | 12.0% |      | 4.0% |
| C    | 34    |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |      |       |       |       |       | 91.2% |      | 8.8% |



## Exhibit 55: US CDO One-Year Refined-Rating Transition Matrix by Cohort Rating in 2008

|      | Total | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1  | Caa2 | Caa3  | Ca    | C     | WR    |       |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|
| Aaa  | 3610  | 48.2% | 2.1%  | 2.6%  | 4.2%  | 1.7%  | 1.8%  | 1.0%  | 1.1%  | 1.7%  | 1.5%  | 1.2%  | 0.9%  | 1.2%  | 1.7%  | 1.2%  | 1.2%  | 1.6%  | 1.0% | 4.5%  | 8.4%  | 4.7%  | 6.5%  |       |
| Aa1  | 252   | 0.8%  | 59.1% | 1.6%  | 1.2%  | 6.7%  | 1.6%  | 1.2%  | 2.4%  | 2.0%  | 4.0%  |       | 0.4%  | 1.6%  | 1.2%  | 0.4%  | 0.8%  | 0.4%  | 1.2% | 2.4%  | 4.4%  | 0.4%  | 6.3%  |       |
| Aa2  | 1236  | 0.1%  | 0.6%  | 51.5% | 1.0%  | 0.5%  | 4.1%  | 2.6%  | 1.1%  | 1.3%  | 2.3%  | 1.4%  | 1.7%  | 0.8%  | 1.1%  | 1.0%  | 1.0%  | 1.9%  | 0.8% | 4.5%  | 11.1% | 6.5%  | 3.3%  |       |
| Aa3  | 249   | 0.8%  | 1.2%  |       | 19.3% | 2.8%  | 0.8%  | 3.2%  | 4.8%  | 4.4%  | 3.6%  | 4.4%  | 2.4%  | 4.0%  | 0.8%  | 0.8%  | 3.2%  | 2.0%  | 0.4% | 8.0%  | 14.5% | 10.4% | 8.0%  |       |
| A1   | 132   |       |       | 1.5%  |       | 45.5% |       | 0.8%  | 6.1%  |       | 0.8%  |       | 1.5%  | 2.3%  | 2.3%  |       | 1.5%  |       | 2.3% | 3.0%  | 12.9% | 11.4% | 8.3%  |       |
| A2   | 1166  | 0.3%  |       | 0.4%  | 0.2%  | 0.3%  | 57.6% | 0.4%  | 1.9%  | 3.7%  | 0.9%  | 0.5%  | 1.5%  | 2.2%  | 0.3%  | 1.5%  | 1.9%  | 0.4%  | 1.0% | 2.5%  | 8.4%  | 10.5% | 3.7%  |       |
| A3   | 428   | 0.5%  |       | 0.9%  | 0.5%  | 0.7%  |       | 24.5% | 3.0%  | 5.6%  | 5.6%  | 2.6%  | 1.2%  | 0.9%  | 2.6%  | 0.9%  | 2.6%  | 3.0%  | 1.2% | 8.4%  | 11.9% | 17.8% | 5.6%  |       |
| Baa1 | 159   | 0.6%  |       | 0.6%  |       |       | 0.6%  |       | 33.3% | 0.6%  |       | 5.7%  |       | 0.6%  | 3.8%  | 3.1%  | 1.9%  |       | 1.3% | 5.7%  | 15.7% | 18.9% | 7.5%  |       |
| Baa2 | 1255  |       |       |       |       | 0.1%  | 0.2%  | 0.2%  | 0.2%  | 55.9% | 1.9%  | 1.1%  | 3.0%  | 0.3%  | 1.8%  | 1.1%  | 1.2%  | 1.4%  | 0.9% | 1.5%  | 8.3%  | 16.5% | 4.4%  |       |
| Baa3 | 374   |       |       |       |       |       |       |       |       | 0.5%  | 38.0% | 0.5%  | 2.1%  | 2.1%  | 1.1%  | 1.1%  | 1.1%  |       | 1.3% | 3.2%  | 15.5% | 25.7% | 7.8%  |       |
| Ba1  | 180   | 0.6%  |       |       |       |       |       |       |       |       |       | 28.3% | 2.2%  |       | 1.1%  | 1.1%  |       |       |      | 1.7%  | 18.9% | 38.3% | 7.8%  |       |
| Ba2  | 662   |       |       |       |       |       |       |       |       | 0.2%  |       |       | 69.5% | 0.2%  | 0.3%  | 2.3%  | 0.5%  | 0.5%  | 0.9% | 1.2%  | 6.5%  | 13.0% | 5.1%  |       |
| Ba3  | 197   |       |       |       |       |       |       |       |       |       | 0.5%  | 1.0%  | 1.5%  | 17.8% | 1.5%  |       | 2.5%  | 2.0%  | 0.5% | 1.0%  | 12.7% | 52.8% | 6.1%  |       |
| B1   | 113   |       |       |       |       |       |       |       |       | 2.7%  |       |       |       |       | 17.7% |       |       |       | 1.8% | 0.9%  | 10.6% | 53.1% | 13.3% |       |
| B2   | 83    |       |       |       |       |       |       |       |       |       |       |       | 1.2%  |       |       | 24.1% |       | 1.2%  |      |       | 16.9% | 42.2% | 14.5% |       |
| B3   | 82    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 15.9% | 2.4%  | 3.7% | 1.2%  | 19.5% | 40.2% | 17.1% |       |
| Caa1 | 81    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 18.5% |      |       | 18.5% | 51.9% | 11.1% |       |
| Caa2 | 85    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 2.4%  |      | 15.3% |       | 21.2% | 43.5% | 17.6% |
| Caa3 | 142   |       |       |       |       |       |       |       |       |       |       |       |       |       | 0.7%  |       |       |       |      | 14.8% | 21.8% | 47.9% | 14.8% |       |
| Ca   | 319   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       | 31.7% | 46.7% | 21.6% |       |
| C    | 151   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       | 92.1% | 7.9%  |       |

**Exhibit 56: Global Structured Finance One-Year Refined-Rating Transition Matrix by Cohort Rating (1984-2008)**

|      | Total   | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1  | Caa2  | Caa3  | Ca    | C     | WR    |
|------|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Aaa  | 3537273 | 85.2% | 0.2%  | 0.2%  | 0.3%  | 0.2%  | 0.2%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.1%  | 0.0%  | 12.7% |
| Aa1  | 189938  | 7.6%  | 77.3% | 0.7%  | 0.6%  | 0.8%  | 0.5%  | 0.5%  | 0.3%  | 0.3%  | 0.4%  | 0.3%  | 0.3%  | 0.4%  | 0.6%  | 0.4%  | 0.6%  | 0.2%  | 0.2%  | 0.1%  | 0.3%  | 0.3%  | 7.3%  |
| Aa2  | 421160  | 4.3%  | 1.5%  | 80.5% | 0.9%  | 0.7%  | 0.6%  | 0.5%  | 0.3%  | 0.3%  | 0.3%  | 0.2%  | 0.2%  | 0.2%  | 0.4%  | 0.4%  | 0.5%  | 0.1%  | 0.2%  | 0.1%  | 0.6%  | 0.5%  | 6.7%  |
| Aa3  | 152503  | 2.9%  | 1.7%  | 1.9%  | 74.2% | 1.3%  | 1.1%  | 1.0%  | 0.8%  | 0.6%  | 0.4%  | 0.3%  | 0.3%  | 0.4%  | 0.8%  | 1.0%  | 1.1%  | 0.4%  | 0.3%  | 0.2%  | 1.0%  | 1.2%  | 6.9%  |
| A1   | 128033  | 1.8%  | 0.9%  | 1.5%  | 2.4%  | 70.7% | 1.7%  | 1.7%  | 1.4%  | 2.0%  | 0.7%  | 0.4%  | 0.3%  | 0.3%  | 0.6%  | 1.0%  | 1.3%  | 0.7%  | 0.4%  | 0.2%  | 0.8%  | 1.0%  | 8.3%  |
| A2   | 398888  | 0.8%  | 0.4%  | 1.4%  | 1.0%  | 1.3%  | 80.6% | 0.6%  | 0.8%  | 0.9%  | 0.6%  | 0.4%  | 0.3%  | 0.3%  | 0.3%  | 0.5%  | 0.7%  | 0.4%  | 0.3%  | 0.2%  | 0.7%  | 0.9%  | 6.6%  |
| A3   | 153708  | 0.8%  | 0.3%  | 0.6%  | 1.3%  | 1.2%  | 1.4%  | 73.1% | 1.2%  | 1.9%  | 1.7%  | 1.1%  | 0.8%  | 0.7%  | 0.6%  | 0.8%  | 1.4%  | 0.9%  | 0.7%  | 0.7%  | 1.5%  | 1.7%  | 5.5%  |
| Baa1 | 123670  | 0.5%  | 0.1%  | 0.2%  | 0.3%  | 1.0%  | 1.2%  | 1.3%  | 72.5% | 1.2%  | 2.0%  | 1.6%  | 1.0%  | 1.1%  | 0.9%  | 0.9%  | 1.6%  | 1.2%  | 1.1%  | 0.9%  | 2.3%  | 2.3%  | 4.8%  |
| Baa2 | 330463  | 0.2%  | 0.1%  | 0.2%  | 0.2%  | 0.3%  | 1.2%  | 1.0%  | 1.3%  | 77.2% | 1.3%  | 1.4%  | 1.0%  | 0.7%  | 0.7%  | 0.7%  | 1.1%  | 0.6%  | 0.6%  | 0.5%  | 1.9%  | 2.0%  | 5.9%  |
| Baa3 | 188359  | 0.3%  | 0.0%  | 0.1%  | 0.1%  | 0.2%  | 0.3%  | 0.7%  | 0.8%  | 1.2%  | 74.0% | 1.2%  | 1.3%  | 1.4%  | 1.0%  | 0.8%  | 1.6%  | 0.7%  | 0.8%  | 0.9%  | 2.9%  | 3.2%  | 6.5%  |
| Ba1  | 66563   | 0.2%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.2%  | 0.3%  | 0.5%  | 0.7%  | 1.7%  | 68.8% | 1.0%  | 1.5%  | 1.3%  | 1.0%  | 1.9%  | 1.0%  | 1.4%  | 1.3%  | 3.8%  | 7.6%  | 5.6%  |
| Ba2  | 119047  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.1%  | 0.1%  | 0.1%  | 0.3%  | 1.2%  | 0.9%  | 1.2%  | 77.7% | 0.7%  | 0.9%  | 0.9%  | 1.1%  | 0.9%  | 0.9%  | 0.8%  | 2.3%  | 4.1%  | 5.7%  |
| Ba3  | 55974   | 0.1%  |       |       | 0.0%  | 0.1%  | 0.2%  | 0.1%  | 0.1%  | 0.2%  | 1.1%  | 0.7%  | 1.0%  | 77.5% | 1.3%  | 1.1%  | 1.5%  | 0.9%  | 1.1%  | 0.8%  | 1.9%  | 3.6%  | 6.6%  |
| B1   | 25825   | 0.1%  |       |       | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.2%  | 0.2%  | 0.3%  | 0.8%  | 0.6%  | 73.4% | 1.9%  | 2.5%  | 1.8%  | 1.4%  | 1.5%  | 2.3%  | 5.9%  | 7.0%  |
| B2   | 47978   | 0.0%  | 0.0%  |       |       | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.1%  | 0.2%  | 0.3%  | 1.2%  | 0.9%  | 0.7%  | 80.9% | 1.5%  | 1.8%  | 1.6%  | 0.7%  | 2.1%  | 2.9%  | 4.9%  |
| B3   | 32036   | 0.0%  |       | 0.0%  |       | 0.0%  |       |       | 0.0%  |       | 0.1%  | 0.1%  | 0.2%  | 0.4%  | 0.3%  | 0.4%  | 73.1% | 2.8%  | 3.6%  | 2.0%  | 3.3%  | 7.8%  | 5.7%  |
| Caa1 | 11681   | 0.1%  |       |       |       |       |       |       |       |       | 0.1%  |       | 0.1%  | 0.1%  | 1.0%  | 0.1%  | 0.4%  | 68.3% | 2.7%  | 3.6%  | 6.4%  | 10.5% | 6.6%  |
| Caa2 | 12781   | 0.1%  |       |       |       |       |       |       |       |       |       | 0.2%  | 0.1%  |       |       | 0.2%  | 0.8%  | 2.1%  | 65.9% | 3.7%  | 8.5%  | 10.0% | 8.5%  |
| Caa3 | 9080    |       |       |       |       |       |       |       | 0.0%  |       | 0.1%  |       |       |       | 0.3%  | 0.4%  | 0.2%  | 0.4%  | 0.1%  | 64.5% | 7.9%  | 14.4% | 11.7% |
| Ca   | 22014   |       |       |       |       |       |       |       |       |       |       |       | 0.1%  | 0.0%  | 0.1%  |       | 0.0%  | 0.1%  |       | 0.0%  | 76.9% | 13.1% | 9.6%  |
| C    | 26604   |       |       |       |       |       |       |       | 0.0%  |       |       |       |       |       |       |       |       |       | 0.1%  |       |       | 87.9% | 12.0% |

**Exhibit 57: Global Structured Finance excluding SFCDOs & 2005-2007 US HEL & RMBS One-Year Refined-Rating Transition Matrix by Cohort Rating (1984-2008)**

|      | Total   | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1  | Caa2  | Caa3  | Ca    | C     | WR    |
|------|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Aaa  | 2992140 | 84.7% | 0.1%  | 0.1%  | 0.2%  | 0.0%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 14.4% |
| Aa1  | 128997  | 11.0% | 76.6% | 0.6%  | 0.3%  | 0.6%  | 0.2%  | 0.1%  | 0.1%  | 0.0%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  |       |       | 0.0%  | 10.3% |
| Aa2  | 350874  | 5.0%  | 1.7%  | 82.5% | 0.9%  | 0.6%  | 0.5%  | 0.4%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 7.8%  |
| Aa3  | 113453  | 3.9%  | 2.1%  | 2.5%  | 77.0% | 1.3%  | 1.0%  | 1.0%  | 0.5%  | 0.5%  | 0.2%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.3%  | 0.0%  | 8.8%  |
| A1   | 97391   | 2.3%  | 1.2%  | 1.8%  | 3.2%  | 74.5% | 1.4%  | 1.2%  | 1.1%  | 1.8%  | 0.4%  | 0.1%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.1%  | 0.0%  | 10.5% |
| A2   | 341378  | 0.9%  | 0.5%  | 1.6%  | 1.1%  | 1.5%  | 84.0% | 0.4%  | 0.5%  | 0.6%  | 0.4%  | 0.2%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 7.6%  |
| A3   | 110266  | 1.1%  | 0.4%  | 0.8%  | 1.8%  | 1.7%  | 1.9%  | 79.0% | 1.0%  | 1.7%  | 1.4%  | 0.8%  | 0.3%  | 0.3%  | 0.2%  | 0.1%  | 0.2%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 6.9%  |
| Baa1 | 89573   | 0.6%  | 0.2%  | 0.3%  | 0.4%  | 1.4%  | 1.7%  | 1.7%  | 80.4% | 1.0%  | 1.8%  | 1.2%  | 0.6%  | 0.6%  | 0.5%  | 0.2%  | 0.2%  | 0.2%  | 0.2%  | 0.2%  | 0.1%  | 0.1%  | 6.3%  |
| Baa2 | 265265  | 0.3%  | 0.1%  | 0.2%  | 0.2%  | 0.4%  | 1.5%  | 1.2%  | 1.6%  | 81.5% | 1.3%  | 1.2%  | 0.8%  | 0.6%  | 0.5%  | 0.4%  | 0.4%  | 0.2%  | 0.2%  | 0.2%  | 0.3%  | 0.2%  | 6.9%  |
| Baa3 | 147537  | 0.3%  | 0.0%  | 0.1%  | 0.1%  | 0.3%  | 0.4%  | 0.9%  | 1.1%  | 1.5%  | 80.2% | 1.2%  | 1.1%  | 1.3%  | 0.8%  | 0.5%  | 0.8%  | 0.3%  | 0.3%  | 0.3%  | 0.6%  | 0.3%  | 7.5%  |
| Ba1  | 47873   | 0.2%  | 0.0%  | 0.0%  | 0.0%  | 0.1%  | 0.3%  | 0.4%  | 0.7%  | 1.0%  | 2.3%  | 79.5% | 1.2%  | 1.5%  | 1.1%  | 0.8%  | 1.3%  | 0.5%  | 0.8%  | 0.4%  | 0.8%  | 0.6%  | 6.4%  |
| Ba2  | 99160   | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.1%  | 0.1%  | 0.2%  | 0.3%  | 1.4%  | 1.1%  | 1.4%  | 82.5% | 0.8%  | 0.8%  | 0.8%  | 0.8%  | 0.7%  | 0.6%  | 0.5%  | 0.7%  | 0.9%  | 6.1%  |
| Ba3  | 49722   | 0.1%  |       |       | 0.0%  | 0.1%  | 0.2%  | 0.1%  | 0.1%  | 0.2%  | 1.1%  | 0.8%  | 1.1%  | 80.6% | 1.4%  | 1.1%  | 1.5%  | 0.9%  | 1.1%  | 0.8%  | 1.2%  | 1.3%  | 6.0%  |
| B1   | 24268   | 0.1%  |       |       | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.2%  | 0.2%  | 0.3%  | 0.8%  | 0.6%  | 77.6% | 2.0%  | 2.7%  | 1.9%  | 1.3%  | 1.5%  | 1.6%  | 2.5%  | 6.5%  |
| B2   | 43652   | 0.1%  | 0.0%  |       |       | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.1%  | 0.3%  | 0.3%  | 1.3%  | 1.0%  | 0.7%  | 82.7% | 1.6%  | 1.9%  | 1.6%  | 0.6%  | 1.5%  | 1.2%  | 5.0%  |
| B3   | 29028   | 0.0%  |       | 0.0%  |       | 0.1%  |       |       | 0.0%  |       | 0.1%  | 0.1%  | 0.2%  | 0.5%  | 0.4%  | 0.4%  | 79.5% | 3.1%  | 3.8%  | 1.9%  | 2.7%  | 1.9%  | 5.3%  |
| Caa1 | 10719   | 0.1%  |       |       |       |       |       |       |       |       | 0.2%  |       | 0.1%  | 0.1%  | 1.1%  | 0.1%  | 0.2%  | 73.8% | 2.9%  | 3.9%  | 6.3%  | 5.3%  | 6.0%  |
| Caa2 | 11645   | 0.1%  |       |       |       |       |       |       |       |       |       |       | 0.1%  |       |       | 0.2%  | 0.9%  | 2.3%  | 70.1% | 3.8%  | 8.0%  | 6.2%  | 8.3%  |
| Caa3 | 7990    |       |       |       |       |       |       |       | 0.0%  |       | 0.1%  |       |       |       | 0.3%  | 0.2%  | 0.3%  | 0.4%  | 0.1%  | 70.3% | 6.5%  | 9.9%  | 11.9% |
| Ca   | 19438   |       |       |       |       |       |       |       |       |       |       |       | 0.0%  |       | 0.1%  |       | 0.0%  | 0.1%  |       | 0.1%  | 82.6% | 8.3%  | 8.8%  |
| C    | 22837   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 90.5% | 9.5%  |

**Exhibit 58: US ABS One-Year Refined-Rating Transition Matrix by Cohort Rating (1984-2008)**

|      | Total   | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3   | Caa1  | Caa2  | Caa3  | Ca    | C     | WR    |
|------|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|
| Aaa  | 1147771 | 81.9% | 0.1%  | 0.2%  | 0.7%  | 0.1%  | 0.4%  | 0.2%  | 0.2%  | 0.1%  | 0.3%  | 0.1%  | 0.0%  | 0.0%  | 0.1%  | 0.0%  | 0.1% | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 15.4% |
| Aa1  | 39853   | 1.7%  | 79.0% | 0.7%  | 1.0%  | 2.0%  | 1.1%  | 0.9%  | 0.7%  | 0.5%  | 0.9%  | 0.7%  | 0.6%  | 0.6%  | 1.4%  | 0.5%  | 0.4% | 0.3%  | 0.7%  | 0.2%  | 0.5%  | 1.2%  | 4.5%  |
| Aa2  | 135779  | 2.5%  | 0.7%  | 83.4% | 0.3%  | 0.7%  | 0.8%  | 0.6%  | 0.3%  | 0.4%  | 0.3%  | 0.3%  | 0.2%  | 0.2%  | 0.8%  | 0.6%  | 0.2% | 0.1%  | 0.3%  | 0.1%  | 0.2%  | 0.8%  | 6.2%  |
| Aa3  | 55810   | 0.9%  | 0.7%  | 0.5%  | 75.7% | 1.0%  | 1.3%  | 1.3%  | 1.2%  | 1.1%  | 0.4%  | 0.4%  | 0.5%  | 0.5%  | 1.4%  | 1.9%  | 1.1% | 0.4%  | 0.5%  | 0.1%  | 1.0%  | 2.5%  | 5.6%  |
| A1   | 62729   | 0.7%  | 0.3%  | 0.6%  | 2.7%  | 69.7% | 1.1%  | 2.1%  | 2.3%  | 3.5%  | 0.9%  | 0.5%  | 0.4%  | 0.3%  | 0.8%  | 1.4%  | 1.3% | 0.8%  | 0.6%  | 0.2%  | 0.3%  | 1.4%  | 7.9%  |
| A2   | 196128  | 0.4%  | 0.2%  | 0.7%  | 0.6%  | 0.9%  | 82.7% | 0.4%  | 1.0%  | 1.0%  | 0.8%  | 0.5%  | 0.4%  | 0.3%  | 0.3%  | 0.5%  | 0.6% | 0.4%  | 0.4%  | 0.2%  | 0.2%  | 0.7%  | 6.8%  |
| A3   | 61697   | 0.3%  | 0.1%  | 0.3%  | 0.5%  | 0.5%  | 0.3%  | 70.4% | 1.4%  | 2.8%  | 2.7%  | 1.8%  | 1.1%  | 1.0%  | 0.9%  | 1.4%  | 2.0% | 1.2%  | 1.5%  | 1.3%  | 0.9%  | 2.7%  | 4.9%  |
| Baa1 | 63522   | 0.1%  | 0.1%  | 0.0%  | 0.1%  | 0.3%  | 0.2%  | 0.3%  | 72.0% | 1.3%  | 2.7%  | 2.2%  | 1.4%  | 1.5%  | 1.3%  | 1.3%  | 2.4% | 1.8%  | 1.8%  | 1.5%  | 1.6%  | 3.3%  | 2.8%  |
| Baa2 | 119984  | 0.1%  | 0.0%  | 0.1%  | 0.1%  | 0.2%  | 0.6%  | 0.4%  | 0.9%  | 74.6% | 1.9%  | 2.1%  | 1.6%  | 1.1%  | 1.0%  | 1.0%  | 1.7% | 0.9%  | 1.3%  | 1.0%  | 1.6%  | 2.7%  | 5.0%  |
| Baa3 | 79645   | 0.2%  | 0.0%  | 0.0%  | 0.1%  | 0.0%  | 0.2%  | 0.2%  | 0.3%  | 0.2%  | 70.3% | 1.6%  | 1.6%  | 1.8%  | 1.5%  | 1.2%  | 2.6% | 1.2%  | 1.4%  | 1.8%  | 3.0%  | 5.3%  | 5.6%  |
| Ba1  | 28088   |       |       |       |       |       |       | 0.0%  |       | 0.1%  | 0.8%  | 58.1% | 1.0%  | 2.3%  | 1.7%  | 1.7%  | 3.4% | 1.8%  | 2.3%  | 2.6%  | 5.0%  | 14.6% | 4.6%  |
| Ba2  | 27967   | 0.1%  | 0.0%  | 0.1%  | 0.0%  | 0.1%  | 0.1%  |       | 0.1%  | 0.2%  | 0.5%  | 0.2%  | 63.4% | 0.4%  | 1.6%  | 2.1%  | 2.5% | 2.3%  | 2.4%  | 2.1%  | 3.5%  | 13.2% | 5.2%  |
| Ba3  | 9213    |       |       |       |       | 0.2%  | 0.1%  | 0.1%  | 0.2%  | 0.1%  | 0.8%  | 0.4%  |       | 58.7% | 1.3%  | 1.7%  | 3.6% | 2.4%  | 2.5%  | 3.1%  | 4.0%  | 14.3% | 6.3%  |
| B1   | 4673    |       |       |       |       |       |       |       |       |       |       |       |       | 51.4% | 1.0%  | 4.2%  | 4.2% | 2.5%  | 4.4%  | 3.8%  | 23.1% | 5.4%  |       |
| B2   | 8315    |       |       |       |       | 0.1%  |       |       | 0.1%  |       |       |       |       | 0.3%  | 68.0% | 1.2%  | 3.7% | 3.0%  | 1.4%  | 5.1%  | 12.8% | 4.1%  |       |
| B3   | 6831    |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 47.2% | 1.8% | 5.1%  | 3.4%  | 6.0%  | 29.8% | 6.7%  |       |
| Caa1 | 4216    |       |       |       |       |       |       |       |       |       | 0.1%  |       |       | 0.3%  |       |       |      | 61.0% | 1.5%  | 3.6%  | 7.5%  | 19.8% | 6.3%  |
| Caa2 | 4541    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 0.3% | 66.5% | 0.6%  | 8.0%  | 16.3% | 8.3%  |       |
| Caa3 | 4221    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       | 68.1% | 2.3%  | 17.7% | 11.9% |       |
| Ca   | 11131   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 0.0% |       |       | 73.2% | 14.9% | 11.9% |       |
| C    | 16572   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |       |       |       | 85.8% | 14.2% |       |

**Exhibit 59: US ABS ex HEL One-Year Refined-Rating Transition Matrix by Cohort Rating (1984-2008)**

|      | Total  | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1  | Caa2  | Caa3  | Ca    | C     | WR    |
|------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Aaa  | 560986 | 83.4% | 0.1%  | 0.1%  | 0.8%  | 0.1%  | 0.4%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 14.6% |
| Aa1  | 12575  | 2.8%  | 77.8% | 1.0%  | 1.1%  | 4.6%  | 1.6%  |       | 0.1%  |       | 0.2%  |       | 0.0%  | 0.0%  | 0.4%  | 0.1%  | 0.0%  | 0.1%  | 0.0%  |       |       |       | 10.1% |
| Aa2  | 38018  | 3.3%  | 0.8%  | 82.3% | 0.3%  | 0.6%  | 0.8%  | 0.6%  | 0.1%  | 0.4%  | 0.2%  | 0.2%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.1%  | 0.0%  | 0.1%  | 0.1%  | 9.7%  |
| Aa3  | 24827  | 1.6%  | 1.0%  | 0.7%  | 77.7% | 0.7%  | 1.1%  | 1.6%  | 1.0%  | 1.4%  | 0.1%  | 0.1%  | 0.3%  | 0.2%  | 0.4%  | 0.3%  | 0.2%  | 0.3%  | 0.0%  | 0.0%  | 1.4%  | 0.1%  | 9.6%  |
| A1   | 35770  | 1.1%  | 0.5%  | 0.8%  | 4.6%  | 70.9% | 0.3%  | 1.6%  | 2.0%  | 4.2%  | 0.6%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.1%  | 0.2%  | 0.0%  | 0.0%  | 0.1%  | 0.0%  | 12.7% |
| A2   | 103177 | 0.5%  | 0.3%  | 0.3%  | 0.4%  | 1.4%  | 85.2% | 0.2%  | 0.3%  | 0.4%  | 0.4%  | 0.2%  | 0.2%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.1%  | 9.6%  |
| A3   | 15545  | 1.0%  | 0.4%  | 0.6%  | 0.8%  | 1.1%  | 0.9%  | 69.5% | 1.2%  | 3.8%  | 3.1%  | 2.0%  | 0.5%  | 0.4%  | 0.3%  | 0.4%  | 0.7%  | 0.2%  | 0.3%  | 0.2%  | 0.1%  | 0.4%  | 12.0% |
| Baa1 | 15114  | 0.3%  | 0.3%  | 0.2%  | 0.1%  | 0.5%  | 0.2%  | 0.8%  | 80.3% | 2.2%  | 3.2%  | 2.1%  | 0.6%  | 0.8%  | 0.9%  | 0.3%  | 0.4%  | 0.2%  | 0.1%  | 0.0%  | 0.1%  | 0.5%  | 5.7%  |
| Baa2 | 37221  | 0.2%  | 0.0%  | 0.2%  | 0.2%  | 0.4%  | 0.8%  | 0.5%  | 2.5%  | 75.0% | 4.5%  | 2.8%  | 1.0%  | 0.8%  | 0.4%  | 0.6%  | 0.4%  | 0.3%  | 0.2%  | 0.1%  | 0.6%  | 0.7%  | 7.6%  |
| Baa3 | 19654  | 0.7%  |       | 0.2%  | 0.2%  | 0.1%  | 0.5%  | 0.2%  | 0.9%  | 0.6%  | 79.6% | 2.3%  | 0.8%  | 1.3%  | 0.3%  | 0.4%  | 0.4%  | 0.4%  | 0.2%  | 0.2%  | 0.6%  | 0.3%  | 9.9%  |
| Ba1  | 7231   |       |       |       |       |       |       |       |       | 0.3%  | 2.2%  | 76.2% | 2.2%  | 4.0%  | 1.3%  | 1.5%  | 2.1%  | 0.3%  | 1.3%  | 0.1%  | 0.7%  | 1.4%  | 6.4%  |
| Ba2  | 7752   | 0.3%  | 0.1%  |       | 0.1%  | 0.1%  | 0.2%  |       | 0.3%  | 0.1%  | 0.8%  | 0.5%  | 68.9% | 0.7%  | 2.1%  | 3.9%  | 2.1%  | 2.1%  | 2.0%  | 0.8%  | 2.2%  | 6.0%  | 6.7%  |
| Ba3  | 4842   |       |       |       |       | 0.4%  | 0.2%  | 0.1%  | 0.2%  | 0.2%  | 1.5%  | 0.7%  |       | 64.3% | 1.9%  | 2.0%  | 3.3%  | 2.8%  | 2.4%  | 2.4%  | 3.1%  | 7.4%  | 6.9%  |
| B1   | 2389   |       |       |       |       |       |       |       |       |       |       |       |       |       | 69.0% | 1.5%  | 7.7%  | 3.6%  | 0.5%  | 3.9%  | 0.9%  | 10.2% | 2.7%  |
| B2   | 3239   |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 70.3% | 1.5%  | 6.6%  | 3.1%  | 1.6%  | 6.6%  | 7.5%  | 2.9%  |
| B3   | 3251   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 73.6% | 3.0%  | 5.1%  | 2.5%  | 6.9%  | 5.2%  | 3.7%  |
| Caa1 | 2534   |       |       |       |       |       |       |       |       |       | 0.2%  |       |       | 0.5%  |       |       |       | 70.0% | 2.4%  | 4.8%  | 10.4% | 8.6%  | 3.0%  |
| Caa2 | 2002   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 0.6%  |       | 66.2% | 0.5%  | 15.1% | 13.1% | 4.4%  |
| Caa3 | 1904   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 72.5% | 2.8%  | 15.3% | 9.5%  |
| Ca   | 5802   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 0.1%  |       |       |       | 79.7% | 11.9% | 8.4%  |
| C    | 12745  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 93.1% | 6.9%  |

**Exhibit 60: US HEL One-Year Refined-Rating Transition Matrix by Cohort Rating (1989-2008)**

|      | Total  | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1  | Caa2  | Caa3  | Ca    | C     | WR    |
|------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Aaa  | 586723 | 80.5% | 0.2%  | 0.3%  | 0.5%  | 0.2%  | 0.4%  | 0.3%  | 0.3%  | 0.1%  | 0.4%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 16.1% |
| Aa1  | 27278  | 1.1%  | 79.5% | 0.5%  | 1.0%  | 0.9%  | 0.9%  | 1.4%  | 1.0%  | 0.8%  | 1.2%  | 1.0%  | 0.8%  | 0.9%  | 1.9%  | 0.7%  | 0.5%  | 0.3%  | 1.0%  | 0.3%  | 0.7%  | 1.8%  | 1.9%  |
| Aa2  | 97718  | 2.2%  | 0.6%  | 83.9% | 0.3%  | 0.8%  | 0.7%  | 0.6%  | 0.4%  | 0.3%  | 0.3%  | 0.4%  | 0.2%  | 0.3%  | 1.1%  | 0.8%  | 0.2%  | 0.2%  | 0.3%  | 0.2%  | 0.3%  | 1.1%  | 4.8%  |
| Aa3  | 30983  | 0.3%  | 0.4%  | 0.3%  | 74.1% | 1.2%  | 1.4%  | 1.0%  | 1.4%  | 0.8%  | 0.6%  | 0.7%  | 0.6%  | 0.7%  | 2.2%  | 3.1%  | 1.8%  | 0.5%  | 0.9%  | 0.2%  | 0.7%  | 4.5%  | 2.4%  |
| A1   | 26942  | 0.1%  | 0.1%  | 0.4%  | 0.2%  | 68.1% | 2.2%  | 2.8%  | 2.7%  | 2.5%  | 1.3%  | 1.1%  | 0.8%  | 0.6%  | 1.9%  | 3.1%  | 3.0%  | 1.8%  | 1.4%  | 0.4%  | 0.7%  | 3.2%  | 1.6%  |
| A2   | 92908  | 0.2%  | 0.2%  | 1.1%  | 0.8%  | 0.3%  | 80.0% | 0.7%  | 1.8%  | 1.6%  | 1.2%  | 0.8%  | 0.7%  | 0.5%  | 0.5%  | 1.0%  | 1.1%  | 0.8%  | 0.9%  | 0.3%  | 0.3%  | 1.4%  | 3.7%  |
| A3   | 46152  | 0.0%  | 0.0%  | 0.2%  | 0.4%  | 0.3%  | 0.1%  | 70.7% | 1.4%  | 2.5%  | 2.5%  | 1.8%  | 1.4%  | 1.2%  | 1.1%  | 1.7%  | 2.5%  | 1.6%  | 1.9%  | 1.7%  | 1.2%  | 3.5%  | 2.5%  |
| Baa1 | 48408  | 0.0%  |       |       | 0.1%  | 0.3%  | 0.2%  | 0.1%  | 69.4% | 1.0%  | 2.5%  | 2.2%  | 1.7%  | 1.7%  | 1.5%  | 1.6%  | 3.0%  | 2.3%  | 2.4%  | 1.9%  | 2.1%  | 4.2%  | 1.9%  |
| Baa2 | 82763  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.1%  | 0.6%  | 0.3%  | 0.1%  | 74.4% | 0.8%  | 1.8%  | 1.9%  | 1.3%  | 1.2%  | 1.2%  | 2.3%  | 1.2%  | 1.7%  | 1.4%  | 2.1%  | 3.6%  | 3.9%  |
| Baa3 | 59991  | 0.0%  | 0.0%  |       | 0.0%  | 0.0%  | 0.0%  | 0.2%  | 0.2%  | 0.0%  | 67.3% | 1.4%  | 1.8%  | 1.9%  | 1.9%  | 1.4%  | 3.3%  | 1.4%  | 1.8%  | 2.3%  | 3.8%  | 6.9%  | 4.2%  |
| Ba1  | 20857  |       |       |       |       |       |       | 0.1%  |       |       | 0.3%  | 51.9% | 0.5%  | 1.7%  | 1.9%  | 1.8%  | 3.8%  | 2.3%  | 2.7%  | 3.4%  | 6.5%  | 19.2% | 4.0%  |
| Ba2  | 20215  |       |       | 0.1%  |       | 0.1%  |       |       | 0.1%  | 0.3%  | 0.4%  | 0.1%  | 61.2% | 0.3%  | 1.4%  | 1.4%  | 2.6%  | 2.4%  | 2.6%  | 2.6%  | 4.0%  | 16.0% | 4.7%  |
| Ba3  | 4371   |       |       |       |       |       |       |       | 0.3%  |       |       |       |       | 52.5% | 0.6%  | 1.4%  | 4.0%  | 1.9%  | 2.7%  | 4.0%  | 5.0%  | 22.0% | 5.7%  |
| B1   | 2284   |       |       |       |       |       |       |       |       |       |       |       |       |       | 33.1% | 0.5%  | 0.5%  | 4.7%  | 4.7%  | 4.8%  | 6.8%  | 36.5% | 8.3%  |
| B2   | 5076   |       |       |       |       | 0.2%  |       |       | 0.2%  |       |       |       |       | 0.5%  |       | 66.6% | 1.0%  | 1.8%  | 3.0%  | 1.3%  | 4.2%  | 16.3% | 4.9%  |
| B3   | 3580   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 23.2% | 0.8%  | 5.0%  | 4.3%  | 5.2%  | 52.1% | 9.5%  |
| Caa1 | 1682   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 47.4% |       | 1.8%  | 3.1%  | 36.6% | 11.2% |
| Caa2 | 2539   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 66.6% | 0.7%  | 2.5%  | 18.8% | 11.3% |
| Caa3 | 2317   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 64.5% | 1.9%  | 19.6% | 14.0% |
| Ca   | 5329   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 66.2% | 18.1% | 15.7% |
| C    | 3827   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 61.7% | 38.3% |

**Exhibit 61: US RMBS One-Year Refined-Rating Transition Matrix by Cohort Rating (1984-2008)**

|      | Total   | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1  | Caa2  | Caa3  | Ca    | C     | WR    |
|------|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Aaa  | 1791798 | 87.3% | 0.2%  | 0.1%  | 0.2%  | 0.2%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 11.3% |
| Aa1  | 113277  | 8.3%  | 78.5% | 0.4%  | 0.4%  | 0.4%  | 0.3%  | 0.4%  | 0.3%  | 0.3%  | 0.3%  | 0.3%  | 0.3%  | 0.4%  | 0.5%  | 0.5%  | 0.8%  | 0.2%  | 0.1%  | 0.1%  | 0.2%  | 0.0%  | 7.2%  |
| Aa2  | 152727  | 5.1%  | 1.5%  | 80.1% | 0.8%  | 0.6%  | 0.6%  | 0.4%  | 0.2%  | 0.3%  | 0.2%  | 0.2%  | 0.2%  | 0.2%  | 0.4%  | 0.5%  | 0.9%  | 0.2%  | 0.1%  | 0.1%  | 0.4%  | 0.1%  | 6.9%  |
| Aa3  | 42431   | 3.7%  | 1.9%  | 1.5%  | 74.4% | 1.5%  | 1.1%  | 0.8%  | 0.6%  | 0.3%  | 0.5%  | 0.3%  | 0.3%  | 0.4%  | 0.8%  | 1.0%  | 2.4%  | 0.6%  | 0.2%  | 0.2%  | 1.2%  | 0.4%  | 5.9%  |
| A1   | 23708   | 1.6%  | 0.9%  | 1.6%  | 0.9%  | 67.6% | 3.5%  | 1.9%  | 0.8%  | 1.0%  | 0.7%  | 0.4%  | 0.4%  | 0.4%  | 0.8%  | 1.6%  | 3.4%  | 1.5%  | 0.4%  | 0.2%  | 2.6%  | 0.7%  | 7.0%  |
| A2   | 75701   | 0.7%  | 0.4%  | 3.3%  | 1.1%  | 0.9%  | 76.7% | 0.7%  | 0.8%  | 0.9%  | 0.8%  | 0.6%  | 0.3%  | 0.4%  | 0.6%  | 0.9%  | 1.7%  | 0.7%  | 0.2%  | 0.1%  | 2.0%  | 0.5%  | 5.7%  |
| A3   | 30038   | 1.4%  | 0.2%  | 0.5%  | 2.3%  | 0.8%  | 0.8%  | 72.0% | 1.2%  | 1.7%  | 1.0%  | 0.7%  | 0.6%  | 1.0%  | 0.8%  | 1.0%  | 2.6%  | 1.3%  | 0.3%  | 0.2%  | 4.4%  | 1.2%  | 4.1%  |
| Baa1 | 16984   | 0.4%  |       | 0.1%  | 0.1%  | 1.1%  | 1.2%  | 0.9%  | 65.0% | 1.1%  | 2.0%  | 1.9%  | 1.1%  | 1.2%  | 1.2%  | 1.4%  | 2.9%  | 1.7%  | 0.6%  | 0.3%  | 9.8%  | 2.7%  | 3.4%  |
| Baa2 | 67728   | 0.3%  | 0.1%  | 0.2%  | 0.3%  | 0.4%  | 2.7%  | 1.1%  | 0.8%  | 77.0% | 0.6%  | 1.0%  | 0.5%  | 0.5%  | 0.8%  | 0.8%  | 1.5%  | 0.6%  | 0.3%  | 0.2%  | 4.1%  | 1.2%  | 5.0%  |
| Baa3 | 38264   | 0.2%  | 0.1%  | 0.2%  | 0.0%  | 0.4%  | 0.5%  | 1.4%  | 0.4%  | 0.3%  | 75.1% | 0.4%  | 0.9%  | 1.0%  | 0.7%  | 0.8%  | 1.7%  | 0.8%  | 0.6%  | 0.2%  | 6.2%  | 2.5%  | 5.4%  |
| Ba1  | 7544    | 0.3%  |       |       |       | 0.0%  | 0.9%  | 0.3%  | 0.7%  | 1.4%  | 1.2%  | 71.8% | 0.6%  | 0.8%  | 0.8%  | 0.4%  | 2.2%  | 0.7%  | 0.6%  | 0.2%  | 7.9%  | 3.0%  | 6.0%  |
| Ba2  | 30486   | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.2%  | 0.3%  | 0.5%  | 3.4%  | 1.2%  | 1.4%  | 79.0% | 0.2%  | 0.3%  | 0.5%  | 0.9%  | 0.5%  | 0.5%  | 0.4%  | 4.3%  | 1.6%  | 4.5%  |
| Ba3  | 9212    | 0.1%  |       |       | 0.1%  | 0.5%  | 0.4%  | 0.4%  | 0.3%  | 0.9%  | 2.6%  | 1.5%  | 0.8%  | 78.4% | 0.2%  | 0.4%  | 0.8%  | 0.5%  | 1.6%  | 0.3%  | 2.6%  | 1.8%  | 5.9%  |
| B1   | 2820    |       |       |       |       |       |       |       |       | 0.4%  |       |       | 1.2%  | 0.7%  | 77.6% | 0.1%  | 2.0%  | 1.1%  | 0.8%  | 0.1%  | 4.4%  | 2.6%  | 8.9%  |
| B2   | 16314   |       | 0.0%  |       |       |       | 0.1%  |       |       | 0.1%  | 0.2%  | 0.8%  | 2.6%  | 1.6%  | 0.9%  | 83.3% | 0.3%  | 0.3%  | 0.3%  | 0.7%  | 2.2%  | 1.0%  | 5.5%  |
| B3   | 5832    |       |       |       |       | 0.3%  |       |       | 0.2%  |       | 0.4%  |       | 0.2%  | 1.6%  | 0.4%  | 0.2%  | 79.9% | 1.6%  | 1.8%  | 0.4%  | 3.3%  | 2.6%  | 7.1%  |
| Caa1 | 2737    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 90.3% |       |       | 3.4%  | 2.3%  | 4.1%  |
| Caa2 | 1506    |       |       |       |       |       |       |       |       |       |       |       | 0.8%  |       |       |       |       | 10.0% | 68.9% | 3.2%  | 4.0%  | 5.5%  | 7.7%  |
| Caa3 | 455     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 69.0% | 9.2%  | 8.1%  | 13.6% |
| Ca   | 1253    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 83.7% | 4.6%  | 11.7% |
| C    | 718     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 83.8% | 16.2% |

## Exhibit 62: US CMBS One-Year Refined-Rating Transition Matrix by Cohort Rating (1987-2008)

|      | Total  | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3    | Caa1  | Caa2  | Caa3  | Ca    | C     | WR    |       |
|------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Aaa  | 170633 | 90.4% | 0.2%  | 0.1%  | 0.0%  | 0.0%  |       |       |       |       |       |       |       |       |       |       | 0.0%  |       |       |       |       |       | 9.2%  |       |
| Aa1  | 9828   | 30.2% | 56.6% | 1.5%  | 0.2%  | 0.3%  | 0.0%  |       | 0.0%  |       | 0.1%  |       |       | 0.1%  |       |       |       |       |       |       |       |       |       | 10.9% |
| Aa2  | 38019  | 12.9% | 4.7%  | 74.6% | 0.4%  | 0.2%  | 0.2%  | 0.1%  | 0.0%  | 0.0%  | 0.1%  |       |       | 0.0%  |       |       | 0.0%  |       | 0.0%  |       |       |       |       | 6.7%  |
| Aa3  | 13510  | 12.6% | 5.1%  | 8.1%  | 67.2% | 0.6%  | 0.2%  | 0.7%  | 0.1%  |       | 0.0%  | 0.1%  |       |       | 0.1%  |       |       | 0.0%  | 0.0%  |       |       |       |       | 5.1%  |
| A1   | 10739  | 10.1% | 4.4%  | 5.4%  | 6.4%  | 63.3% | 0.4%  | 0.6%  | 0.3%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.2%  | 0.0%  |       |       |       | 0.0%  |       |       |       |       | 8.4%  |
| A2   | 31267  | 2.9%  | 2.0%  | 3.5%  | 4.1%  | 5.4%  | 75.4% | 0.8%  | 0.5%  | 0.2%  | 0.1%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  |       |       |       |       | 0.0%  |       |       |       | 4.7%  |
| A3   | 21462  | 2.1%  | 1.2%  | 2.1%  | 3.2%  | 4.6%  | 6.0%  | 74.3% | 0.6%  | 0.7%  | 0.6%  | 0.0%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  |       |       |       |       | 0.0%  |       |       | 4.2%  |
| Baa1 | 18945  | 1.8%  | 0.3%  | 0.9%  | 1.2%  | 2.8%  | 4.3%  | 4.8%  | 73.7% | 0.8%  | 0.7%  | 0.6%  | 0.2%  | 0.4%  | 0.3%  | 0.0%  |       |       | 0.1%  |       | 0.0%  |       |       | 7.2%  |
| Baa2 | 35119  | 0.8%  | 0.2%  | 0.5%  | 0.6%  | 0.9%  | 2.7%  | 3.7%  | 4.7%  | 77.7% | 0.8%  | 0.6%  | 0.4%  | 0.2%  | 0.1%  | 0.0%  | 0.1%  | 0.0%  | 0.0%  |       | 0.0%  | 0.0%  |       | 5.9%  |
| Baa3 | 33085  | 0.5%  |       | 0.2%  | 0.2%  | 0.6%  | 0.5%  | 1.2%  | 3.0%  | 4.5%  | 78.4% | 0.8%  | 0.8%  | 0.9%  | 0.1%  | 0.1%  | 0.1%  | 0.0%  | 0.2%  |       | 0.1%  |       |       | 7.6%  |
| Ba1  | 16558  | 0.4%  |       | 0.1%  | 0.0%  | 0.1%  | 0.3%  | 0.6%  | 0.8%  | 1.4%  | 4.0%  | 85.3% | 1.2%  | 1.0%  | 0.5%  | 0.2%  | 0.2%  | 0.1%  | 0.0%  |       |       |       |       | 4.0%  |
| Ba2  | 21660  | 0.2%  |       |       |       | 0.2%  | 0.1%  | 0.1%  | 0.2%  | 1.0%  | 1.1%  | 3.2%  | 87.4% | 1.5%  | 1.0%  | 0.4%  | 0.5%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  |       |       | 3.1%  |
| Ba3  | 17591  | 0.2%  |       |       |       |       | 0.0%  | 0.1%  | 0.1%  | 0.1%  | 1.0%  | 1.0%  | 2.0%  | 88.6% | 1.8%  | 1.2%  | 0.6%  | 0.3%  | 0.1%  |       | 0.0%  |       |       | 2.9%  |
| B1   | 12569  | 0.2%  |       |       |       |       | 0.0%  |       |       | 0.0%  | 0.3%  | 0.2%  | 0.6%  | 0.8%  | 89.6% | 2.5%  | 2.0%  | 0.8%  | 0.3%  | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 2.4%  |
| B2   | 17711  | 0.1%  |       |       |       |       | 0.0%  | 0.0%  | 0.0%  |       | 0.1%  | 0.1%  | 0.6%  | 0.6%  | 0.6%  | 88.6% | 3.2%  | 2.3%  | 1.3%  | 0.2%  | 0.2%  | 0.1%  | 1.9%  |       |
| B3   | 15303  | 0.0%  |       | 0.0%  |       |       |       |       |       |       | 0.0%  | 0.1%  | 0.0%  | 0.1%  | 0.4%  | 0.6%  | 87.4% | 4.0%  | 3.2%  | 1.0%  | 0.8%  | 0.2%  | 2.0%  |       |
| Caa1 | 1980   | 0.4%  |       |       |       |       |       |       |       |       |       |       |       |       | 0.5%  | 0.3%  | 0.6%  | 69.4% | 8.6%  | 6.7%  | 5.5%  | 3.5%  | 4.4%  |       |
| Caa2 | 3449   |       |       |       |       |       |       |       |       |       |       |       | 0.1%  |       |       | 0.2%  | 1.0%  | 1.2%  | 73.2% | 7.4%  | 7.9%  | 4.4%  | 4.4%  |       |
| Caa3 | 854    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 0.7%  | 71.7% | 10.9% | 10.8% | 6.0%  |       |
| Ca   | 1437   |       |       |       |       |       |       |       |       |       |       |       |       |       | 0.4%  |       |       | 0.4%  |       |       | 73.6% | 18.5% | 7.1%  |       |
| C    | 1100   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 77.8% | 22.2% |       |



**Exhibit 63: US CDO One-Year Refined-Rating Transition Matrix by Cohort Rating (1990-2008)**

|      | Total  | Aaa   | Aa1   | Aa2   | Aa3   | A1    | A2    | A3    | Baa1  | Baa2  | Baa3  | Ba1   | Ba2   | Ba3   | B1    | B2    | B3   | Caa1  | Caa2  | Caa3  | Ca    | C     | WR    |
|------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|
| Aaa  | 137427 | 82.7% | 0.8%  | 0.7%  | 0.7%  | 0.4%  | 0.5%  | 0.4%  | 0.3%  | 0.3%  | 0.4%  | 0.4%  | 0.3%  | 0.3%  | 0.5%  | 0.2%  | 0.4% | 0.2%  | 0.4%  | 0.4%  | 1.7%  | 1.0%  | 6.8%  |
| Aa1  | 10181  | 3.0%  | 81.4% | 1.1%  | 1.1%  | 0.8%  | 1.0%  | 0.7%  | 0.2%  | 0.2%  | 0.9%  | 0.2%  | 0.2%  | 0.3%  | 0.1%  | 0.1%  | 0.1% | 0.0%  | 0.1%  | 0.1%  | 1.0%  | 0.0%  | 7.4%  |
| Aa2  | 45729  | 0.8%  | 0.5%  | 78.8% | 1.2%  | 1.1%  | 0.8%  | 1.0%  | 0.6%  | 0.5%  | 0.7%  | 0.6%  | 0.4%  | 0.3%  | 0.4%  | 0.3%  | 0.7% | 0.4%  | 0.3%  | 0.5%  | 2.9%  | 1.8%  | 5.5%  |
| Aa3  | 12191  | 1.7%  | 0.2%  | 0.4%  | 67.5% | 2.8%  | 1.6%  | 2.4%  | 1.6%  | 0.8%  | 1.6%  | 1.0%  | 0.8%  | 0.9%  | 0.2%  | 0.3%  | 0.6% | 0.3%  | 0.2%  | 0.7%  | 3.7%  | 1.8%  | 8.7%  |
| A1   | 7893   | 1.6%  | 0.6%  | 1.9%  | 0.6%  | 74.6% | 0.8%  | 1.0%  | 1.3%  | 1.0%  | 1.4%  | 0.5%  | 0.2%  | 0.2%  | 0.3%  | 0.3%  | 0.6% | 0.2%  | 0.2%  | 0.3%  | 1.2%  | 1.3%  | 9.8%  |
| A2   | 38322  | 0.3%  | 0.1%  | 0.2%  | 0.2%  | 0.3%  | 79.9% | 0.5%  | 0.6%  | 0.8%  | 0.8%  | 0.6%  | 0.6%  | 0.4%  | 0.2%  | 0.3%  | 0.3% | 0.3%  | 0.4%  | 0.4%  | 2.7%  | 4.3%  | 5.8%  |
| A3   | 23780  | 0.6%  | 0.2%  | 0.4%  | 0.9%  | 0.4%  | 0.3%  | 78.1% | 1.1%  | 1.4%  | 1.3%  | 1.0%  | 1.0%  | 0.5%  | 0.6%  | 0.4%  | 0.4% | 0.7%  | 0.2%  | 0.7%  | 1.5%  | 2.0%  | 6.3%  |
| Baa1 | 7236   | 1.1%  | 0.7%  | 0.1%  | 0.0%  | 0.7%  | 0.6%  | 0.2%  | 72.7% | 0.4%  | 1.8%  | 1.7%  | 0.5%  | 1.1%  | 0.6%  | 0.3%  | 0.4% | 0.2%  | 0.4%  | 0.6%  | 2.5%  | 3.4%  | 10.0% |
| Baa2 | 58566  | 0.1%  | 0.0%  | 0.2%  | 0.1%  | 0.1%  | 0.2%  | 0.2%  | 0.2%  | 79.6% | 1.1%  | 1.1%  | 1.0%  | 0.7%  | 0.8%  | 0.5%  | 0.7% | 0.5%  | 0.6%  | 0.5%  | 2.4%  | 4.0%  | 5.5%  |
| Baa3 | 19458  | 0.2%  | 0.2%  | 0.0%  | 0.2%  | 0.0%  | 0.2%  | 0.3%  | 0.2%  | 0.1%  | 73.3% | 1.6%  | 1.6%  | 2.4%  | 2.0%  | 1.0%  | 0.9% | 0.4%  | 0.7%  | 0.7%  | 3.0%  | 4.0%  | 6.8%  |
| Ba1  | 6654   | 0.3%  | 0.2%  |       | 0.2%  |       | 0.2%  | 0.0%  | 1.1%  | 0.4%  | 0.2%  | 59.5% | 1.8%  | 0.7%  | 2.9%  | 1.5%  | 1.1% | 0.8%  | 2.6%  | 1.4%  | 7.1%  | 10.7% | 7.5%  |
| Ba2  | 25569  |       |       |       | 0.1%  | 0.0%  | 0.0%  | 0.1%  | 0.2%  | 0.2%  | 0.5%  | 0.1%  | 82.1% | 0.7%  | 0.8%  | 1.0%  | 0.7% | 0.7%  | 0.6%  | 0.8%  | 1.7%  | 2.4%  | 7.3%  |
| Ba3  | 12345  |       |       |       |       |       | 0.4%  | 0.1%  |       | 0.0%  | 0.6%  | 0.3%  | 0.5%  | 73.3% | 1.7%  | 0.7%  | 1.7% | 1.4%  | 1.6%  | 0.9%  | 3.3%  | 4.3%  | 9.1%  |
| B1   | 4047   |       |       |       | 0.3%  | 0.3%  | 0.0%  | 0.3%  | 0.1%  | 0.7%  | 0.3%  | 0.6%  | 0.9%  |       | 58.4% | 2.3%  | 2.9% | 2.9%  | 4.0%  | 3.6%  | 6.6%  | 8.7%  | 7.0%  |
| B2   | 3931   |       |       |       |       |       |       |       |       |       | 0.9%  |       | 0.7%  | 0.5%  | 0.6%  | 70.3% | 0.2% | 2.4%  | 4.1%  | 1.8%  | 4.3%  | 3.1%  | 11.1% |
| B3   | 2763   |       |       |       |       |       |       |       |       |       | 0.9%  | 1.7%  | 0.8%  | 0.3%  | 0.4%  | 53.6% | 1.7% | 6.2%  | 6.6%  | 10.9% | 9.1%  | 7.7%  |       |
| Caa1 | 1864   |       |       |       |       |       |       |       |       |       | 0.3%  |       | 0.6%  |       | 0.6%  |       | 1.3% | 60.2% | 0.5%  | 5.6%  | 10.9% | 13.2% | 6.7%  |
| Caa2 | 2594   |       |       |       |       |       |       |       |       |       |       | 0.9%  |       |       | 0.5%  | 1.8%  |      |       | 55.4% | 4.0%  | 13.9% | 11.0% | 12.5% |
| Caa3 | 2749   |       |       |       |       |       |       |       | 0.1%  |       | 0.3%  |       |       | 1.0%  | 1.3%  | 0.3%  | 0.8% |       |       | 56.3% | 16.7% | 14.6% | 8.5%  |
| Ca   | 7061   |       |       |       |       |       |       |       |       |       | 0.2%  |       |       |       |       |       | 0.2% |       |       |       | 81.0% | 12.3% | 6.3%  |
| C    | 7610   |       |       |       |       |       |       |       | 0.0%  |       |       |       |       |       |       |       |      |       |       | 0.3%  |       | 94.6% | 5.1%  |

## Matrices by Original Rating

**Exhibit 64: Global Structured Finance Rating Transition Matrices by Original Rating (1984-2008)**

| 1-year        | Aaa   | Aa    | A     | Baa   | Ba    | B     | Caa and below | WR    |
|---------------|-------|-------|-------|-------|-------|-------|---------------|-------|
| Aaa           | 94.0% | 0.5%  | 0.3%  | 0.3%  | 0.1%  | 0.1%  | 0.3%          | 4.3%  |
| Aa            | 0.7%  | 92.3% | 1.3%  | 0.8%  | 0.8%  | 1.7%  | 1.2%          | 1.0%  |
| A             | 0.1%  | 0.5%  | 87.4% | 3.4%  | 1.9%  | 2.7%  | 2.8%          | 1.2%  |
| Baa           | 0.0%  | 0.0%  | 0.3%  | 87.2% | 2.3%  | 2.5%  | 6.6%          | 1.0%  |
| Ba            | 0.0%  | 0.0%  | 0.0%  | 0.4%  | 88.9% | 1.9%  | 7.6%          | 1.2%  |
| B             | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.7%  | 93.4% | 1.4%          | 4.5%  |
| Caa and below | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 92.3%         | 7.7%  |
| 2-year        | Aaa   | Aa    | A     | Baa   | Ba    | B     | Caa and below | WR    |
| Aaa           | 82.5% | 1.0%  | 0.7%  | 0.5%  | 0.3%  | 0.3%  | 0.5%          | 14.3% |
| Aa            | 3.1%  | 80.8% | 2.5%  | 1.3%  | 1.2%  | 3.2%  | 4.2%          | 3.7%  |
| A             | 0.6%  | 2.4%  | 77.4% | 3.7%  | 1.1%  | 3.5%  | 7.7%          | 3.6%  |
| Baa           | 0.2%  | 0.2%  | 1.6%  | 76.6% | 3.0%  | 2.4%  | 11.2%         | 4.7%  |
| Ba            | 0.0%  | 0.1%  | 0.1%  | 1.8%  | 76.1% | 3.4%  | 13.6%         | 4.9%  |
| B             | 0.1%  | 0.0%  | 0.1%  | 0.2%  | 2.4%  | 87.3% | 3.0%          | 7.0%  |
| Caa and below | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 78.9%         | 21.1% |
| 3-year        | Aaa   | Aa    | A     | Baa   | Ba    | B     | Caa and below | WR    |
| Aaa           | 70.4% | 1.0%  | 0.5%  | 0.3%  | 0.2%  | 0.1%  | 0.1%          | 27.4% |
| Aa            | 6.9%  | 74.5% | 3.6%  | 2.1%  | 0.9%  | 0.7%  | 1.1%          | 10.3% |
| A             | 1.7%  | 4.6%  | 72.2% | 5.8%  | 2.3%  | 1.5%  | 3.2%          | 8.6%  |
| Baa           | 0.6%  | 0.8%  | 3.3%  | 69.7% | 4.5%  | 3.7%  | 7.8%          | 9.5%  |
| Ba            | 0.0%  | 0.2%  | 1.1%  | 3.6%  | 69.0% | 4.0%  | 13.7%         | 8.3%  |
| B             | 0.1%  | 0.1%  | 0.2%  | 0.3%  | 4.4%  | 78.3% | 7.0%          | 9.7%  |
| Caa and below | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 1.6%  | 0.0%  | 67.2%         | 31.3% |
| 4-year        | Aaa   | Aa    | A     | Baa   | Ba    | B     | Caa and below | WR    |
| Aaa           | 58.8% | 0.9%  | 0.3%  | 0.2%  | 0.1%  | 0.1%  | 0.1%          | 39.5% |
| Aa            | 12.8% | 59.7% | 3.7%  | 2.1%  | 0.8%  | 0.3%  | 0.7%          | 19.9% |
| A             | 2.4%  | 8.0%  | 59.6% | 5.8%  | 2.5%  | 0.7%  | 1.8%          | 19.2% |
| Baa           | 0.8%  | 1.2%  | 5.8%  | 56.1% | 6.2%  | 4.2%  | 6.6%          | 19.2% |
| Ba            | 0.2%  | 0.3%  | 1.7%  | 6.0%  | 60.1% | 4.6%  | 11.6%         | 15.6% |
| B             | 0.0%  | 0.1%  | 0.3%  | 0.3%  | 5.9%  | 67.7% | 11.6%         | 14.0% |
| Caa and below | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 2.0%  | 0.0%  | 60.0%         | 38.0% |
| 5-year        | Aaa   | Aa    | A     | Baa   | Ba    | B     | Caa and below | WR    |
| Aaa           | 47.2% | 0.7%  | 0.3%  | 0.2%  | 0.1%  | 0.1%  | 0.2%          | 51.2% |
| Aa            | 17.0% | 44.0% | 4.0%  | 2.4%  | 0.9%  | 0.6%  | 1.2%          | 29.9% |
| A             | 3.4%  | 8.7%  | 45.6% | 4.7%  | 2.7%  | 0.8%  | 2.3%          | 31.8% |
| Baa           | 1.1%  | 1.7%  | 6.6%  | 42.8% | 5.1%  | 3.2%  | 8.5%          | 30.9% |
| Ba            | 0.2%  | 0.3%  | 2.2%  | 6.7%  | 50.3% | 3.8%  | 11.1%         | 25.4% |
| B             | 0.0%  | 0.1%  | 0.2%  | 0.7%  | 5.7%  | 58.9% | 15.0%         | 19.4% |
| Caa and below | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 2.5%  | 2.5%  | 70.0%         | 25.0% |

**For WR Ratings in the 5-year cohort**

| Original Rating | Rating before WR |       |       |       |       |       |               | WR   |
|-----------------|------------------|-------|-------|-------|-------|-------|---------------|------|
|                 | Aaa              | Aa    | A     | Baa   | Ba    | B     | Caa and below |      |
| Aaa             | 98.9%            | 0.8%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.1%          | 0.0% |
| Aa              | 21.3%            | 71.9% | 3.9%  | 1.6%  | 0.2%  | 0.2%  | 0.9%          | 0.0% |
| A               | 8.5%             | 12.2% | 73.3% | 3.6%  | 1.2%  | 0.4%  | 0.8%          | 0.0% |
| Baa             | 4.0%             | 4.2%  | 9.1%  | 73.6% | 4.3%  | 1.8%  | 3.0%          | 0.0% |
| Ba              | 1.0%             | 1.1%  | 5.3%  | 9.7%  | 69.8% | 5.5%  | 7.4%          | 0.0% |
| B               | 2.8%             | 0.6%  | 1.1%  | 5.6%  | 19.7% | 48.3% | 21.9%         | 0.0% |
| Caa and below   | 0.0%             | 0.0%  | 0.0%  | 0.0%  | 10.0% | 0.0%  | 90.0%         | 0.0% |

**Exhibit 65: Global Structured Finance excluding SFDOs & 2005-2007 US RMBS & HEL Rating Transition Matrices by Original Rating (1984-2008)**

| 1-year        | Aaa   | Aa    | A     | Baa   | Ba    | B     | Caa and below | WR    |
|---------------|-------|-------|-------|-------|-------|-------|---------------|-------|
| Aaa           | 93.6% | 0.3%  | 0.1%  | 0.1%  | 0.0%  | 0.0%  | 0.0%          | 5.8%  |
| Aa            | 1.2%  | 95.9% | 1.1%  | 0.1%  | 0.1%  | 0.0%  | 0.1%          | 1.6%  |
| A             | 0.2%  | 0.8%  | 95.6% | 1.5%  | 0.2%  | 0.0%  | 0.1%          | 1.6%  |
| Baa           | 0.1%  | 0.0%  | 0.4%  | 97.2% | 0.7%  | 0.2%  | 0.2%          | 1.2%  |
| Ba            | 0.0%  | 0.0%  | 0.0%  | 0.5%  | 97.8% | 0.5%  | 0.2%          | 0.9%  |
| B             | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.8%  | 94.3% | 0.5%          | 4.4%  |
| Caa and below | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 92.3%         | 7.7%  |
| 2-year        | Aaa   | Aa    | A     | Baa   | Ba    | B     | Caa and below | WR    |
| Aaa           | 81.6% | 0.5%  | 0.2%  | 0.1%  | 0.0%  | 0.0%  | 0.0%          | 17.6% |
| Aa            | 4.6%  | 86.9% | 2.3%  | 0.6%  | 0.1%  | 0.1%  | 0.2%          | 5.1%  |
| A             | 0.8%  | 3.4%  | 87.2% | 3.2%  | 0.6%  | 0.2%  | 0.4%          | 4.2%  |
| Baa           | 0.3%  | 0.3%  | 2.5%  | 88.5% | 2.0%  | 0.5%  | 0.5%          | 5.4%  |
| Ba            | 0.0%  | 0.1%  | 0.1%  | 2.6%  | 89.8% | 2.0%  | 1.6%          | 3.8%  |
| B             | 0.1%  | 0.0%  | 0.1%  | 0.2%  | 2.6%  | 88.1% | 2.5%          | 6.5%  |
| Caa and below | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 78.7%         | 21.3% |
| 3-year        | Aaa   | Aa    | A     | Baa   | Ba    | B     | Caa and below | WR    |
| Aaa           | 68.6% | 0.6%  | 0.2%  | 0.1%  | 0.0%  | 0.0%  | 0.0%          | 30.3% |
| Aa            | 8.5%  | 74.3% | 2.5%  | 1.6%  | 0.4%  | 0.1%  | 0.2%          | 12.4% |
| A             | 2.1%  | 5.3%  | 75.8% | 4.2%  | 1.3%  | 0.4%  | 0.7%          | 10.1% |
| Baa           | 0.8%  | 1.0%  | 4.1%  | 76.1% | 3.2%  | 1.7%  | 1.8%          | 11.3% |
| Ba            | 0.0%  | 0.2%  | 1.3%  | 4.4%  | 76.9% | 3.6%  | 5.7%          | 7.9%  |
| B             | 0.1%  | 0.1%  | 0.2%  | 0.3%  | 4.6%  | 78.5% | 6.5%          | 9.8%  |
| Caa and below | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 1.6%  | 0.0%  | 67.2%         | 31.3% |
| 4-year        | Aaa   | Aa    | A     | Baa   | Ba    | B     | Caa and below | WR    |
| Aaa           | 58.6% | 0.8%  | 0.2%  | 0.1%  | 0.1%  | 0.1%  | 0.1%          | 40.0% |
| Aa            | 13.2% | 59.7% | 3.5%  | 2.1%  | 0.7%  | 0.2%  | 0.5%          | 20.1% |
| A             | 2.5%  | 8.1%  | 59.8% | 5.7%  | 2.5%  | 0.7%  | 1.4%          | 19.4% |
| Baa           | 0.8%  | 1.1%  | 6.0%  | 56.6% | 6.2%  | 4.1%  | 5.8%          | 19.4% |
| Ba            | 0.2%  | 0.3%  | 1.8%  | 6.2%  | 61.5% | 4.5%  | 11.4%         | 14.2% |
| B             | 0.0%  | 0.1%  | 0.3%  | 0.3%  | 6.0%  | 67.9% | 11.7%         | 13.7% |
| Caa and below | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 2.0%  | 0.0%  | 60.0%         | 38.0% |
| 5-year        | Aaa   | Aa    | A     | Baa   | Ba    | B     | Caa and below | WR    |
| Aaa           | 47.0% | 0.6%  | 0.3%  | 0.1%  | 0.1%  | 0.1%  | 0.2%          | 51.7% |
| Aa            | 17.4% | 43.9% | 3.8%  | 2.3%  | 0.8%  | 0.5%  | 1.0%          | 30.2% |
| A             | 3.4%  | 8.7%  | 45.7% | 4.8%  | 2.7%  | 0.8%  | 2.0%          | 32.0% |
| Baa           | 1.2%  | 1.7%  | 6.7%  | 43.4% | 5.2%  | 3.2%  | 7.5%          | 31.1% |
| Ba            | 0.2%  | 0.4%  | 2.3%  | 6.7%  | 52.2% | 3.8%  | 10.8%         | 23.6% |
| B             | 0.0%  | 0.1%  | 0.2%  | 0.7%  | 5.7%  | 59.1% | 15.2%         | 19.0% |
| Caa and below | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 2.5%  | 2.5%  | 70.0%         | 25.0% |

**For WR Ratings in the 5-year cohort**

| Original Rating | Rating before WR |       |       |       |       |       |               | WR   |
|-----------------|------------------|-------|-------|-------|-------|-------|---------------|------|
|                 | Aaa              | Aa    | A     | Baa   | Ba    | B     | Caa and below |      |
| Aaa             | 99.0%            | 0.8%  | 0.1%  | 0.0%  | 0.0%  | 0.0%  | 0.1%          | 0.0% |
| Aa              | 21.7%            | 71.4% | 3.9%  | 1.7%  | 0.2%  | 0.2%  | 0.9%          | 0.0% |
| A               | 8.6%             | 12.3% | 73.0% | 3.7%  | 1.1%  | 0.4%  | 0.9%          | 0.0% |
| Baa             | 4.1%             | 4.2%  | 9.4%  | 73.2% | 4.3%  | 1.8%  | 3.0%          | 0.0% |
| Ba              | 1.1%             | 1.3%  | 6.0%  | 11.0% | 66.7% | 5.6%  | 8.2%          | 0.0% |
| B               | 2.9%             | 0.6%  | 1.2%  | 5.8%  | 20.2% | 46.8% | 22.5%         | 0.0% |
| Caa and below   | 0.0%             | 0.0%  | 0.0%  | 0.0%  | 10.0% | 0.0%  | 90.0%         | 0.0% |

**Exhibit 66: US ABS Rating Transition Matrices by Original Rating (1984-2008)**

| <b>1-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
|---------------|------------|-----------|----------|------------|-----------|----------|----------------------|-----------|
| Aaa           | 95.6%      | 0.8%      | 0.5%     | 0.4%       | 0.1%      | 0.1%     | 0.0%                 | 2.5%      |
| Aa            | 0.2%       | 91.6%     | 1.5%     | 1.5%       | 1.5%      | 2.6%     | 0.7%                 | 0.5%      |
| A             | 0.0%       | 0.4%      | 85.1%    | 4.0%       | 2.6%      | 3.7%     | 2.5%                 | 1.6%      |
| Baa           | 0.0%       | 0.0%      | 0.1%     | 83.9%      | 2.5%      | 3.6%     | 9.4%                 | 0.4%      |
| Ba            | 0.0%       | 0.0%      | 0.0%     | 0.4%       | 77.0%     | 3.3%     | 18.1%                | 1.1%      |
| B             | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 97.7%    | 1.5%                 | 0.8%      |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 0.0%     | 100.0%               | 0.0%      |
| <b>2-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 80.4%      | 1.2%      | 0.8%     | 0.7%       | 0.4%      | 0.3%     | 0.4%                 | 15.8%     |
| Aa            | 1.0%       | 79.3%     | 2.6%     | 2.2%       | 1.6%      | 4.1%     | 7.0%                 | 2.2%      |
| A             | 0.3%       | 2.0%      | 76.1%    | 4.3%       | 1.0%      | 4.0%     | 8.7%                 | 3.6%      |
| Baa           | 0.1%       | 0.1%      | 0.7%     | 73.7%      | 3.2%      | 2.8%     | 15.9%                | 3.6%      |
| Ba            | 0.0%       | 0.1%      | 0.0%     | 0.8%       | 55.2%     | 7.2%     | 30.0%                | 6.7%      |
| B             | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 94.7%    | 3.5%                 | 1.8%      |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 0.0%     | 100.0%               | 0.0%      |
| <b>3-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 63.9%      | 0.8%      | 0.4%     | 0.3%       | 0.2%      | 0.1%     | 0.1%                 | 34.2%     |
| Aa            | 3.1%       | 80.0%     | 3.4%     | 3.3%       | 0.7%      | 0.4%     | 1.7%                 | 7.3%      |
| A             | 1.4%       | 3.8%      | 71.2%    | 8.8%       | 2.6%      | 1.2%     | 3.1%                 | 7.9%      |
| Baa           | 0.6%       | 0.6%      | 2.0%     | 67.5%      | 6.9%      | 5.6%     | 11.3%                | 5.5%      |
| Ba            | 0.1%       | 0.1%      | 0.4%     | 1.5%       | 43.9%     | 7.0%     | 37.0%                | 10.0%     |
| B             | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 69.5%    | 23.2%                | 7.4%      |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 0.0%     | 100.0%               | 0.0%      |
| <b>4-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 53.4%      | 1.2%      | 0.4%     | 0.3%       | 0.2%      | 0.2%     | 0.2%                 | 44.3%     |
| Aa            | 6.3%       | 65.9%     | 4.1%     | 3.7%       | 1.3%      | 0.4%     | 1.4%                 | 16.9%     |
| A             | 1.0%       | 6.2%      | 60.1%    | 8.1%       | 3.4%      | 0.8%     | 1.7%                 | 18.8%     |
| Baa           | 0.4%       | 0.6%      | 3.2%     | 53.9%      | 10.5%     | 7.6%     | 9.4%                 | 14.4%     |
| Ba            | 0.2%       | 0.6%      | 0.4%     | 2.7%       | 37.2%     | 9.2%     | 31.6%                | 18.0%     |
| B             | 0.0%       | 0.0%      | 1.1%     | 0.0%       | 1.1%      | 53.4%    | 22.7%                | 21.6%     |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 0.0%     | 100.0%               | 0.0%      |
| <b>5-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 44.5%      | 0.9%      | 0.4%     | 0.3%       | 0.2%      | 0.2%     | 0.4%                 | 53.1%     |
| Aa            | 6.7%       | 49.9%     | 5.1%     | 5.4%       | 1.0%      | 1.1%     | 2.8%                 | 28.1%     |
| A             | 1.0%       | 5.7%      | 46.3%    | 6.7%       | 4.0%      | 0.9%     | 2.5%                 | 32.9%     |
| Baa           | 0.3%       | 0.6%      | 2.5%     | 41.8%      | 8.4%      | 6.0%     | 13.5%                | 26.8%     |
| Ba            | 0.0%       | 0.6%      | 0.0%     | 2.9%       | 33.8%     | 4.5%     | 29.9%                | 28.3%     |
| B             | 0.0%       | 0.0%      | 1.3%     | 0.0%       | 3.8%      | 40.0%    | 20.0%                | 35.0%     |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 0.0%     | 100.0%               | 0.0%      |

**For WR Ratings in the 5-year cohort**

| <b>Original Rating</b> | <b>Rating before WR</b> |           |          |            |           |          |                      | <b>WR</b> |
|------------------------|-------------------------|-----------|----------|------------|-----------|----------|----------------------|-----------|
|                        | <b>Aaa</b>              | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> |           |
| Aaa                    | 99.0%                   | 0.6%      | 0.1%     | 0.1%       | 0.0%      | 0.0%     | 0.2%                 | 0.0%      |
| Aa                     | 13.3%                   | 75.2%     | 4.2%     | 4.0%       | 0.2%      | 0.2%     | 3.0%                 | 0.0%      |
| A                      | 5.3%                    | 10.6%     | 78.2%    | 4.4%       | 0.3%      | 0.2%     | 1.1%                 | 0.0%      |
| Baa                    | 4.7%                    | 3.0%      | 5.9%     | 78.5%      | 1.4%      | 1.1%     | 5.4%                 | 0.0%      |
| Ba                     | 0.0%                    | 1.1%      | 3.4%     | 5.7%       | 75.0%     | 3.4%     | 11.4%                | 0.0%      |
| B                      | 0.0%                    | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 25.0%    | 75.0%                | 0.0%      |
| Caa and below          |                         |           |          |            |           |          |                      |           |

**Exhibit 67: US ABS ex HEL Rating Transition Matrices by Original Rating (1984-2008)**

| 1-year        | Aaa   | Aa    | A     | Baa   | Ba    | B     | Caa and below | WR    |
|---------------|-------|-------|-------|-------|-------|-------|---------------|-------|
| Aaa           | 96.2% | 0.6%  | 0.4%  | 0.4%  | 0.0%  | 0.0%  | 0.1%          | 2.3%  |
| Aa            | 0.7%  | 95.2% | 1.4%  | 0.2%  | 0.1%  | 0.0%  | 0.7%          | 1.7%  |
| A             | 0.1%  | 1.0%  | 91.4% | 3.2%  | 0.1%  | 0.1%  | 0.1%          | 4.1%  |
| Baa           | 0.0%  | 0.0%  | 0.3%  | 97.0% | 1.9%  | 0.4%  | 0.2%          | 0.2%  |
| Ba            | 0.0%  | 0.0%  | 0.0%  | 2.2%  | 92.6% | 3.0%  | 1.1%          | 1.1%  |
| B             | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 95.7% | 4.3%          | 0.0%  |
| Caa and below | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 100.0%        | 0.0%  |
| 2-year        | Aaa   | Aa    | A     | Baa   | Ba    | B     | Caa and below | WR    |
| Aaa           | 85.7% | 0.9%  | 0.5%  | 0.2%  | 0.1%  | 0.0%  | 0.2%          | 12.4% |
| Aa            | 2.6%  | 83.5% | 4.7%  | 2.2%  | 0.1%  | 0.1%  | 1.4%          | 5.4%  |
| A             | 0.7%  | 4.9%  | 79.7% | 7.4%  | 0.4%  | 0.2%  | 0.5%          | 6.1%  |
| Baa           | 0.4%  | 0.6%  | 3.6%  | 85.9% | 4.2%  | 1.4%  | 1.5%          | 2.3%  |
| Ba            | 0.0%  | 0.4%  | 0.0%  | 4.9%  | 73.2% | 6.9%  | 8.5%          | 6.1%  |
| B             | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 92.3% | 5.1%          | 2.6%  |
| Caa and below | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 100.0%        | 0.0%  |
| 3-year        | Aaa   | Aa    | A     | Baa   | Ba    | B     | Caa and below | WR    |
| Aaa           | 70.7% | 1.4%  | 0.6%  | 0.2%  | 0.2%  | 0.1%  | 0.2%          | 26.5% |
| Aa            | 4.7%  | 69.4% | 4.6%  | 7.6%  | 1.1%  | 0.1%  | 1.8%          | 10.7% |
| A             | 2.8%  | 5.5%  | 65.5% | 9.1%  | 2.2%  | 0.6%  | 1.3%          | 13.1% |
| Baa           | 2.7%  | 2.4%  | 3.7%  | 68.1% | 5.4%  | 3.0%  | 5.2%          | 9.4%  |
| Ba            | 0.5%  | 0.5%  | 1.9%  | 4.7%  | 44.6% | 8.0%  | 24.9%         | 15.0% |
| B             | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 62.5% | 37.5%         | 0.0%  |
| Caa and below | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 100.0%        | 0.0%  |
| 4-year        | Aaa   | Aa    | A     | Baa   | Ba    | B     | Caa and below | WR    |
| Aaa           | 56.3% | 1.6%  | 0.5%  | 0.2%  | 0.3%  | 0.3%  | 0.3%          | 40.6% |
| Aa            | 2.9%  | 54.1% | 5.3%  | 7.6%  | 3.0%  | 0.9%  | 3.3%          | 23.0% |
| A             | 1.3%  | 5.1%  | 53.4% | 7.2%  | 3.8%  | 0.8%  | 2.4%          | 26.0% |
| Baa           | 1.3%  | 1.0%  | 2.5%  | 54.1% | 6.2%  | 2.3%  | 9.2%          | 23.4% |
| Ba            | 0.5%  | 0.5%  | 1.0%  | 3.7%  | 30.9% | 4.2%  | 35.1%         | 24.1% |
| B             | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 44.8% | 37.9%         | 17.2% |
| Caa and below | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 100.0%        | 0.0%  |
| 5-year        | Aaa   | Aa    | A     | Baa   | Ba    | B     | Caa and below | WR    |
| Aaa           | 43.8% | 1.0%  | 0.6%  | 0.3%  | 0.3%  | 0.4%  | 0.6%          | 53.0% |
| Aa            | 3.3%  | 42.7% | 3.8%  | 9.1%  | 1.8%  | 2.1%  | 5.3%          | 31.8% |
| A             | 1.1%  | 3.5%  | 41.6% | 6.3%  | 4.1%  | 0.5%  | 3.0%          | 39.8% |
| Baa           | 0.8%  | 0.6%  | 1.2%  | 40.5% | 6.6%  | 2.6%  | 11.9%         | 35.8% |
| Ba            | 0.0%  | 0.6%  | 0.0%  | 1.7%  | 18.6% | 4.7%  | 41.3%         | 33.1% |
| B             | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 29.2% | 41.7%         | 29.2% |
| Caa and below | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 100.0%        | 0.0%  |

**For WR Ratings in the 5-year cohort**

| Original Rating | Rating before WR |       |       |       |       |       |               | WR   |
|-----------------|------------------|-------|-------|-------|-------|-------|---------------|------|
|                 | Aaa              | Aa    | A     | Baa   | Ba    | B     | Caa and below |      |
| Aaa             | 98.3%            | 1.1%  | 0.2%  | 0.1%  | 0.0%  | 0.0%  | 0.3%          | 0.0% |
| Aa              | 8.3%             | 73.7% | 7.3%  | 7.0%  | 0.0%  | 0.0%  | 3.7%          | 0.0% |
| A               | 6.0%             | 10.3% | 77.4% | 4.8%  | 0.2%  | 0.2%  | 1.1%          | 0.0% |
| Baa             | 9.1%             | 4.7%  | 6.2%  | 74.3% | 1.4%  | 0.7%  | 3.6%          | 0.0% |
| Ba              | 0.0%             | 0.0%  | 5.3%  | 5.3%  | 82.5% | 0.0%  | 7.0%          | 0.0% |
| B               | 0.0%             | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 57.1% | 42.9%         | 0.0% |
| Caa and below   |                  |       |       |       |       |       |               |      |

**Exhibit 68: US HEL Rating Transition Matrices by Original Rating (1989-2008)**

| <b>1-year</b>                              | <b>Aaa</b>              | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
|--|-------------------------|-----------|----------|------------|-----------|----------|----------------------|-----------|
| Aaa  | 95.1%                   | 1.0%      | 0.5%     | 0.4%       | 0.1%      | 0.1%     | 0.0%                 | 2.7%      |
| Aa   | 0.1%                    | 90.7%     | 1.5%     | 1.8%       | 1.9%      | 3.2%     | 0.7%                 | 0.2%      |
| A  | 0.0%                    | 0.0%      | 81.7%    | 4.5%       | 4.1%      | 5.8%     | 3.8%                 | 0.2%      |
| Baa  | 0.0%                    | 0.0%      | 0.0%     | 81.2%      | 2.7%      | 4.3%     | 11.4%                | 0.4%      |
| Ba   | 0.0%                    | 0.0%      | 0.0%     | 0.1%       | 74.3%     | 3.4%     | 21.1%                | 1.1%      |
| B  | 0.0%                    | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 98.8%    | 0.0%                 | 1.2%      |
| Caa and below                              | 0.0%                    | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 0.0%     | 100.0%               | 0.0%      |
| <b>2-year</b>                              | <b>Aaa</b>              | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa  | 76.4%                   | 1.4%      | 1.0%     | 1.1%       | 0.6%      | 0.6%     | 0.6%                 | 18.4%     |
| Aa   | 0.5%                    | 78.2%     | 2.0%     | 2.2%       | 2.1%      | 5.3%     | 8.5%                 | 1.3%      |
| A  | 0.0%                    | 0.3%      | 73.8%    | 2.3%       | 1.3%      | 6.4%     | 13.9%                | 2.0%      |
| Baa  | 0.0%                    | 0.0%      | 0.1%     | 71.2%      | 3.0%      | 3.1%     | 18.9%                | 3.9%      |
| Ba   | 0.0%                    | 0.0%      | 0.0%     | 0.1%       | 51.8%     | 7.3%     | 34.0%                | 6.9%      |
| B  | 0.0%                    | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 96.0%    | 2.7%                 | 1.3%      |
| Caa and below                              | 0.0%                    | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 0.0%     | 100.0%               | 0.0%      |
| <b>3-year</b>                              | <b>Aaa</b>              | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa  | 58.1%                   | 0.4%      | 0.1%     | 0.4%       | 0.1%      | 0.0%     | 0.1%                 | 40.8%     |
| Aa   | 2.4%                    | 84.3%     | 3.0%     | 1.6%       | 0.6%      | 0.5%     | 1.7%                 | 6.0%      |
| A  | 0.1%                    | 2.3%      | 76.3%    | 8.5%       | 3.0%      | 1.8%     | 4.8%                 | 3.2%      |
| Baa  | 0.1%                    | 0.1%      | 1.6%     | 67.3%      | 7.2%      | 6.3%     | 13.0%                | 4.5%      |
| Ba   | 0.0%                    | 0.0%      | 0.0%     | 0.5%       | 43.7%     | 6.7%     | 40.5%                | 8.6%      |
| B  | 0.0%                    | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 73.0%    | 15.9%                | 11.1%     |
| Caa and below                              |                         |           |          |            |           |          |                      |           |
| <b>4-year</b>                              | <b>Aaa</b>              | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa  | 50.5%                   | 0.8%      | 0.2%     | 0.4%       | 0.0%      | 0.1%     | 0.1%                 | 47.9%     |
| Aa   | 8.5%                    | 73.6%     | 3.3%     | 1.0%       | 0.2%      | 0.1%     | 0.2%                 | 12.9%     |
| A  | 0.5%                    | 7.8%      | 69.7%    | 9.4%       | 2.8%      | 0.8%     | 0.6%                 | 8.4%      |
| Baa  | 0.1%                    | 0.4%      | 3.4%     | 53.9%      | 12.2%     | 9.5%     | 9.4%                 | 11.1%     |
| Ba   | 0.0%                    | 0.7%      | 0.0%     | 2.1%       | 41.5%     | 12.5%    | 29.3%                | 13.9%     |
| B  | 0.0%                    | 0.0%      | 1.7%     | 0.0%       | 1.7%      | 57.6%    | 15.3%                | 23.7%     |
| Caa and below                              |                         |           |          |            |           |          |                      |           |
| <b>5-year</b>                              | <b>Aaa</b>              | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa  | 45.3%                   | 0.8%      | 0.2%     | 0.3%       | 0.0%      | 0.0%     | 0.2%                 | 53.1%     |
| Aa   | 10.1%                   | 57.0%     | 6.3%     | 1.7%       | 0.2%      | 0.1%     | 0.2%                 | 24.3%     |
| A  | 1.0%                    | 10.6%     | 57.2%    | 7.6%       | 3.8%      | 1.9%     | 1.1%                 | 16.8%     |
| Baa  | 0.1%                    | 0.6%      | 3.3%     | 42.5%      | 9.5%      | 8.0%     | 14.4%                | 21.5%     |
| Ba   | 0.0%                    | 0.7%      | 0.0%     | 4.3%       | 52.5%     | 4.3%     | 15.8%                | 22.3%     |
| B  | 0.0%                    | 0.0%      | 1.8%     | 0.0%       | 5.4%      | 44.6%    | 10.7%                | 37.5%     |
| Caa and below                              |                         |           |          |            |           |          |                      |           |
| <b>For WR Ratings in the 5-year cohort</b> |                         |           |          |            |           |          |                      |           |
| <b>Original Rating</b>                     | <b>Rating before WR</b> |           |          |            |           |          |                      | <b>WR</b> |
|  | <b>Aaa</b>              | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> |           |
| Aaa  | 99.9%                   | 0.1%      | 0.0%     | 0.0%       | 0.0%      | 0.0%     | 0.0%                 | 0.0%      |
| Aa   | 19.7%                   | 77.2%     | 0.0%     | 0.0%       | 0.4%      | 0.4%     | 2.2%                 | 0.0%      |
| A  | 1.2%                    | 12.4%     | 82.2%    | 2.4%       | 0.6%      | 0.0%     | 1.2%                 | 0.0%      |
| Baa  | 0.4%                    | 1.4%      | 5.7%     | 82.7%      | 1.4%      | 1.4%     | 7.1%                 | 0.0%      |
| Ba   | 0.0%                    | 3.2%      | 0.0%     | 6.5%       | 61.3%     | 9.7%     | 19.4%                | 0.0%      |
| B  | 0.0%                    | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 14.3%    | 85.7%                | 0.0%      |
| Caa and below                              |                         |           |          |            |           |          |                      |           |

**Exhibit 69: US RMBS Rating Transition Matrices by Original Rating (1984-2008)**

| <b>1-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
|---------------|------------|-----------|----------|------------|-----------|----------|----------------------|-----------|
| Aaa           | 93.9%      | 0.3%      | 0.2%     | 0.1%       | 0.1%      | 0.0%     | 0.0%                 | 5.5%      |
| Aa            | 1.0%       | 93.6%     | 1.1%     | 0.6%       | 0.5%      | 2.2%     | 0.2%                 | 0.7%      |
| A             | 0.1%       | 0.3%      | 85.3%    | 5.0%       | 2.0%      | 4.4%     | 2.7%                 | 0.2%      |
| Baa           | 0.0%       | 0.0%      | 0.3%     | 84.1%      | 4.0%      | 4.4%     | 6.7%                 | 0.5%      |
| Ba            | 0.0%       | 0.0%      | 0.0%     | 0.7%       | 90.0%     | 3.0%     | 5.8%                 | 0.5%      |
| B             | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.8%      | 95.1%    | 3.7%                 | 0.4%      |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 0.0%     | 100.0%               | 0.0%      |
| <b>2-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 83.3%      | 0.7%      | 0.7%     | 0.3%       | 0.3%      | 0.2%     | 0.0%                 | 14.4%     |
| Aa            | 4.5%       | 81.5%     | 2.3%     | 1.0%       | 1.3%      | 4.6%     | 2.3%                 | 2.6%      |
| A             | 0.4%       | 3.7%      | 69.7%    | 4.3%       | 1.7%      | 7.9%     | 11.2%                | 1.1%      |
| Baa           | 0.1%       | 0.2%      | 3.2%     | 69.3%      | 3.1%      | 5.7%     | 16.8%                | 1.6%      |
| Ba            | 0.0%       | 0.3%      | 0.3%     | 5.5%       | 76.8%     | 1.5%     | 14.0%                | 1.5%      |
| B             | 0.0%       | 0.0%      | 0.2%     | 0.4%       | 7.0%      | 88.3%    | 2.4%                 | 1.7%      |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 0.0%     | 100.0%               | 0.0%      |
| <b>3-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 73.1%      | 0.9%      | 0.5%     | 0.3%       | 0.2%      | 0.0%     | 0.0%                 | 25.1%     |
| Aa            | 11.0%      | 71.9%     | 3.9%     | 1.4%       | 0.8%      | 1.1%     | 0.5%                 | 9.3%      |
| A             | 2.7%       | 8.2%      | 69.4%    | 2.6%       | 2.6%      | 3.6%     | 4.9%                 | 5.9%      |
| Baa           | 0.3%       | 1.5%      | 7.8%     | 68.1%      | 1.7%      | 4.2%     | 9.4%                 | 7.0%      |
| Ba            | 0.0%       | 0.4%      | 3.7%     | 11.5%      | 69.7%     | 0.6%     | 7.8%                 | 6.3%      |
| B             | 0.0%       | 0.0%      | 0.5%     | 0.2%       | 13.5%     | 73.4%    | 4.0%                 | 8.4%      |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 0.0%     | 100.0%               | 0.0%      |
| <b>4-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 61.2%      | 0.4%      | 0.1%     | 0.0%       | 0.0%      | 0.0%     | 0.0%                 | 38.3%     |
| Aa            | 19.5%      | 57.7%     | 3.1%     | 0.9%       | 0.2%      | 0.1%     | 0.0%                 | 18.5%     |
| A             | 6.8%       | 14.9%     | 57.6%    | 2.4%       | 1.5%      | 0.5%     | 0.8%                 | 15.6%     |
| Baa           | 1.2%       | 3.6%      | 13.5%    | 60.0%      | 1.9%      | 1.3%     | 2.2%                 | 16.2%     |
| Ba            | 0.3%       | 0.3%      | 6.3%     | 16.5%      | 59.5%     | 1.5%     | 3.2%                 | 12.3%     |
| B             | 0.0%       | 0.3%      | 0.6%     | 0.6%       | 17.7%     | 61.2%    | 4.1%                 | 15.7%     |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 100.0%    | 0.0%     | 0.0%                 | 0.0%      |
| <b>5-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 48.6%      | 0.3%      | 0.1%     | 0.0%       | 0.0%      | 0.0%     | 0.0%                 | 51.0%     |
| Aa            | 25.5%      | 42.5%     | 3.4%     | 0.8%       | 0.4%      | 0.2%     | 0.2%                 | 27.0%     |
| A             | 10.2%      | 17.5%     | 44.4%    | 2.0%       | 1.2%      | 0.2%     | 1.4%                 | 23.1%     |
| Baa           | 2.6%       | 5.2%      | 15.3%    | 47.9%      | 1.6%      | 0.3%     | 2.2%                 | 24.9%     |
| Ba            | 0.6%       | 0.4%      | 8.4%     | 17.6%      | 52.0%     | 1.3%     | 1.5%                 | 18.1%     |
| B             | 0.0%       | 0.4%      | 0.4%     | 2.2%       | 15.5%     | 53.5%    | 4.1%                 | 24.0%     |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 100.0%    | 0.0%     | 0.0%                 | 0.0%      |

**For WR Ratings in the 5-year cohort**

| <b>Original Rating</b> | <b>Rating before WR</b> |           |          |            |           |          |                      | <b>WR</b> |
|------------------------|-------------------------|-----------|----------|------------|-----------|----------|----------------------|-----------|
|                        | <b>Aaa</b>              | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> |           |
| Aaa                    | 99.3%                   | 0.6%      | 0.0%     | 0.0%       | 0.0%      | 0.0%     | 0.0%                 | 0.0%      |
| Aa                     | 25.6%                   | 71.5%     | 2.4%     | 0.3%       | 0.0%      | 0.0%     | 0.1%                 | 0.0%      |
| A                      | 14.7%                   | 25.6%     | 58.3%    | 1.4%       | 0.0%      | 0.0%     | 0.0%                 | 0.0%      |
| Baa                    | 3.4%                    | 11.6%     | 19.3%    | 63.9%      | 0.9%      | 0.9%     | 0.0%                 | 0.0%      |
| Ba                     | 2.4%                    | 0.0%      | 21.4%    | 22.6%      | 45.2%     | 1.2%     | 7.1%                 | 0.0%      |
| B                      | 3.1%                    | 0.0%      | 0.0%     | 4.6%       | 40.0%     | 46.2%    | 6.2%                 | 0.0%      |
| Caa and below          |                         |           |          |            |           |          |                      |           |

**Exhibit 70: US CMBS Rating Transition Matrices by Original Rating (1987-2008)**

| <b>1-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
|---------------|------------|-----------|----------|------------|-----------|----------|----------------------|-----------|
| Aaa           | 98.6%      | 0.3%      | 0.0%     | 0.0%       | 0.0%      | 0.0%     | 0.0%                 | 1.1%      |
| Aa            | 1.7%       | 96.8%     | 0.4%     | 0.0%       | 0.1%      | 0.0%     | 0.0%                 | 0.9%      |
| A             | 0.2%       | 0.8%      | 96.4%    | 1.2%       | 0.6%      | 0.1%     | 0.0%                 | 0.6%      |
| Baa           | 0.0%       | 0.1%      | 0.5%     | 96.1%      | 0.8%      | 0.3%     | 0.0%                 | 2.2%      |
| Ba            | 0.0%       | 0.0%      | 0.0%     | 0.4%       | 98.8%     | 0.3%     | 0.0%                 | 0.4%      |
| B             | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.1%      | 99.0%    | 0.5%                 | 0.5%      |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 0.0%     | 97.3%                | 2.7%      |
| <b>2-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 91.3%      | 0.6%      | 0.0%     | 0.0%       | 0.0%      | 0.0%     | 0.0%                 | 8.1%      |
| Aa            | 8.1%       | 83.3%     | 0.8%     | 0.1%       | 0.0%      | 0.2%     | 0.0%                 | 7.5%      |
| A             | 1.5%       | 4.3%      | 85.5%    | 1.3%       | 1.2%      | 0.1%     | 0.0%                 | 6.1%      |
| Baa           | 0.3%       | 0.4%      | 3.4%     | 81.1%      | 2.6%      | 0.3%     | 0.1%                 | 11.8%     |
| Ba            | 0.0%       | 0.0%      | 0.1%     | 1.3%       | 93.0%     | 1.6%     | 0.0%                 | 4.1%      |
| B             | 0.1%       | 0.0%      | 0.0%     | 0.1%       | 0.4%      | 95.1%    | 2.8%                 | 1.4%      |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 0.0%     | 93.9%                | 6.1%      |
| <b>3-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 83.1%      | 0.8%      | 0.1%     | 0.0%       | 0.0%      | 0.0%     | 0.0%                 | 16.0%     |
| Aa            | 10.7%      | 68.4%     | 1.4%     | 1.0%       | 0.0%      | 0.0%     | 0.0%                 | 18.6%     |
| A             | 3.0%       | 5.9%      | 73.0%    | 1.9%       | 1.9%      | 0.2%     | 0.0%                 | 14.1%     |
| Baa           | 1.1%       | 1.1%      | 3.9%     | 66.8%      | 2.6%      | 1.1%     | 0.1%                 | 23.2%     |
| Ba            | 0.0%       | 0.1%      | 0.8%     | 1.7%       | 87.9%     | 3.1%     | 0.2%                 | 6.2%      |
| B             | 0.1%       | 0.1%      | 0.1%     | 0.3%       | 0.7%      | 90.5%    | 4.7%                 | 3.4%      |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 3.1%      | 0.0%     | 87.5%                | 9.4%      |
| <b>4-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 75.9%      | 0.6%      | 0.1%     | 0.0%       | 0.0%      | 0.1%     | 0.0%                 | 23.5%     |
| Aa            | 23.6%      | 47.3%     | 1.0%     | 0.5%       | 0.7%      | 0.0%     | 0.2%                 | 26.7%     |
| A             | 4.6%       | 14.8%     | 55.6%    | 2.4%       | 1.6%      | 0.1%     | 0.0%                 | 21.0%     |
| Baa           | 2.1%       | 1.4%      | 8.0%     | 52.7%      | 2.7%      | 0.4%     | 0.3%                 | 32.3%     |
| Ba            | 0.4%       | 0.3%      | 0.6%     | 4.1%       | 80.9%     | 4.8%     | 0.9%                 | 8.0%      |
| B             | 0.0%       | 0.0%      | 0.0%     | 0.2%       | 1.2%      | 80.3%    | 11.6%                | 6.7%      |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 0.0%     | 84.4%                | 15.6%     |
| <b>5-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 67.5%      | 0.6%      | 0.1%     | 0.0%       | 0.0%      | 0.0%     | 0.0%                 | 31.8%     |
| Aa            | 29.2%      | 35.2%     | 1.2%     | 0.3%       | 0.9%      | 0.0%     | 0.6%                 | 32.6%     |
| A             | 9.3%       | 17.8%     | 42.2%    | 3.1%       | 1.4%      | 0.6%     | 0.0%                 | 25.7%     |
| Baa           | 2.6%       | 2.6%      | 10.1%    | 42.3%      | 2.1%      | 0.3%     | 0.4%                 | 39.7%     |
| Ba            | 0.0%       | 0.6%      | 0.8%     | 5.5%       | 72.1%     | 6.2%     | 2.3%                 | 12.6%     |
| B             | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 1.5%      | 71.1%    | 15.8%                | 11.7%     |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 3.1%     | 81.3%                | 15.6%     |

**For WR Ratings in the 5-year cohort**

| <b>Original Rating</b> | <b>Rating before WR</b> |           |          |            |           |          |                      | <b>WR</b> |
|------------------------|-------------------------|-----------|----------|------------|-----------|----------|----------------------|-----------|
|                        | <b>Aaa</b>              | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> |           |
| Aaa                    | 96.7%                   | 2.7%      | 0.4%     | 0.0%       | 0.0%      | 0.2%     | 0.0%                 | 0.0%      |
| Aa                     | 41.4%                   | 54.1%     | 1.4%     | 1.4%       | 0.0%      | 1.4%     | 0.5%                 | 0.0%      |
| A                      | 19.7%                   | 21.3%     | 49.2%    | 2.7%       | 6.6%      | 0.0%     | 0.5%                 | 0.0%      |
| Baa                    | 6.0%                    | 4.9%      | 10.7%    | 64.7%      | 9.6%      | 2.9%     | 1.3%                 | 0.0%      |
| Ba                     | 3.0%                    | 4.5%      | 10.4%    | 17.9%      | 47.8%     | 13.4%    | 3.0%                 | 0.0%      |
| B                      | 5.6%                    | 1.9%      | 1.9%     | 11.1%      | 16.7%     | 40.7%    | 22.2%                | 0.0%      |
| Caa and below          | 0.0%                    | 0.0%      | 0.0%     | 0.0%       | 20.0%     | 0.0%     | 80.0%                | 0.0%      |



**Exhibit 71: US CDO Rating Transition Matrices by Original Rating (1990-2008)**

| <b>1-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
|---------------|------------|-----------|----------|------------|-----------|----------|----------------------|-----------|
| Aaa           | 86.0%      | 1.1%      | 1.1%     | 1.5%       | 1.5%      | 1.6%     | 5.7%                 | 1.5%      |
| Aa            | 0.0%       | 86.4%     | 1.7%     | 1.0%       | 1.4%      | 1.1%     | 7.1%                 | 1.2%      |
| A             | 0.0%       | 0.0%      | 85.2%    | 2.5%       | 1.7%      | 1.0%     | 8.8%                 | 0.7%      |
| Baa           | 0.0%       | 0.0%      | 0.1%     | 85.1%      | 2.2%      | 1.2%     | 10.6%                | 0.8%      |
| Ba            | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 90.2%     | 1.3%     | 7.7%                 | 0.8%      |
| B             | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 92.0%    | 3.0%                 | 5.0%      |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 0.0%     | 50.0%                | 50.0%     |
| <b>2-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 83.4%      | 1.8%      | 0.9%     | 1.0%       | 1.4%      | 1.4%     | 6.7%                 | 3.5%      |
| Aa            | 0.4%       | 78.9%     | 2.5%     | 1.8%       | 1.2%      | 1.1%     | 10.4%                | 3.7%      |
| A             | 0.0%       | 0.2%      | 81.2%    | 2.4%       | 1.0%      | 0.9%     | 11.4%                | 2.8%      |
| Baa           | 0.0%       | 0.1%      | 0.2%     | 82.4%      | 3.0%      | 0.8%     | 10.6%                | 2.8%      |
| Ba            | 0.0%       | 0.0%      | 0.0%     | 0.2%       | 84.8%     | 1.4%     | 10.8%                | 2.8%      |
| B             | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 83.2%    | 9.5%                 | 7.4%      |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 0.0%     | 50.0%                | 50.0%     |
| <b>3-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 84.4%      | 3.6%      | 1.5%     | 1.7%       | 0.7%      | 1.0%     | 1.3%                 | 5.7%      |
| Aa            | 1.4%       | 75.9%     | 5.9%     | 3.6%       | 2.7%      | 1.8%     | 3.0%                 | 5.7%      |
| A             | 0.4%       | 1.0%      | 79.9%    | 4.0%       | 2.1%      | 1.8%     | 5.8%                 | 5.0%      |
| Baa           | 0.1%       | 0.5%      | 0.5%     | 76.4%      | 5.3%      | 3.5%     | 9.8%                 | 4.0%      |
| Ba            | 0.0%       | 0.0%      | 0.0%     | 0.9%       | 75.6%     | 5.9%     | 13.5%                | 4.1%      |
| B             | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 59.1%    | 29.5%                | 11.4%     |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 0.0%     | 50.0%                | 50.0%     |
| <b>4-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 74.5%      | 5.6%      | 3.4%     | 1.0%       | 0.9%      | 0.5%     | 0.4%                 | 13.6%     |
| Aa            | 1.7%       | 63.4%     | 7.8%     | 5.8%       | 2.8%      | 2.3%     | 2.6%                 | 13.6%     |
| A             | 0.2%       | 1.5%      | 66.2%    | 5.5%       | 3.5%      | 1.4%     | 5.5%                 | 16.2%     |
| Baa           | 0.1%       | 0.5%      | 1.0%     | 58.1%      | 6.0%      | 5.9%     | 16.0%                | 12.5%     |
| Ba            | 0.0%       | 0.0%      | 0.0%     | 0.9%       | 59.6%     | 4.9%     | 21.2%                | 13.3%     |
| B             | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 48.2%    | 38.6%                | 13.3%     |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 0.0%     | 50.0%                | 50.0%     |
| <b>5-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> | <b>WR</b> |
| Aaa           | 60.0%      | 5.7%      | 2.9%     | 1.5%       | 1.2%      | 0.8%     | 0.6%                 | 27.3%     |
| Aa            | 1.8%       | 48.3%     | 8.0%     | 7.0%       | 4.1%      | 2.2%     | 3.5%                 | 25.2%     |
| A             | 0.2%       | 2.4%      | 50.4%    | 3.8%       | 2.4%      | 2.6%     | 5.4%                 | 32.8%     |
| Baa           | 0.1%       | 0.3%      | 0.7%     | 40.6%      | 7.1%      | 6.3%     | 20.4%                | 24.5%     |
| Ba            | 0.0%       | 0.0%      | 0.0%     | 1.3%       | 45.1%     | 4.5%     | 22.6%                | 26.5%     |
| B             | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 37.2%    | 48.7%                | 14.1%     |
| Caa and below | 0.0%       | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 0.0%     | 0.0%                 | 100.0%    |

**For WR Ratings in the 5-year cohort**

| <b>Original Rating</b> | <b>Rating before WR</b> |           |          |            |           |          |                      | <b>WR</b> |
|------------------------|-------------------------|-----------|----------|------------|-----------|----------|----------------------|-----------|
|                        | <b>Aaa</b>              | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa and below</b> |           |
| Aaa                    | 94.8%                   | 3.1%      | 1.8%     | 0.3%       | 0.0%      | 0.0%     | 0.0%                 | 0.0%      |
| Aa                     | 2.6%                    | 84.9%     | 8.6%     | 2.0%       | 1.3%      | 0.0%     | 0.7%                 | 0.0%      |
| A                      | 2.5%                    | 4.5%      | 84.6%    | 4.5%       | 3.5%      | 0.0%     | 0.5%                 | 0.0%      |
| Baa                    | 0.9%                    | 1.4%      | 3.6%     | 82.0%      | 5.4%      | 2.3%     | 4.5%                 | 0.0%      |
| Ba                     | 0.0%                    | 0.0%      | 0.0%     | 3.2%       | 80.6%     | 5.6%     | 10.5%                | 0.0%      |
| B                      | 0.0%                    | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 81.8%    | 18.2%                | 0.0%      |
| Caa and below          | 0.0%                    | 0.0%      | 0.0%     | 0.0%       | 0.0%      | 0.0%     | 100.0%               | 0.0%      |

## Moody's Related Research

### Special Comments:

- Structured Finance Rating Transitions: 1983-2007, February 2008 (107444)
- EMEA Structured Finance Rating Transitions: 1988-2007, March 2008 (107977)
- Japanese Structured Finance Rating Transitions: 1994-2007, March 2008 (107833)
- Asia Pacific (ex-Japan) Structured Finance Rating Transitions: 1990-2007, March 2008 (107947)
- Default & Loss Rates of Structured Finance Securities: 1993-2007, July 2008 (109707)
- Measuring Loss-Given-Default for Structured Finance Securities: An Update, December 2006 (101284)
- The Performance of Structured Finance Ratings: Mid-Year 2008 Report, November 2008 (112347)
- Guide to Moody's Default Research: October 2008 Update, November 2008 (112205)

### Special Reports:

- Rating Changes in the U.S. Asset-Backed Securities Market: 2008 Fourth Quarter Update, January 2009 (114635)
- Moody's Modifies Approach to Rating Structured Finance Securities Wrapped by Financial Guarantors, November 2008
- Subprime RMBS Loss Projection Update: September 2008 (SF142628)
- Alt-A RMBS Loss Projection Update: January 2009 (SF153720)
- Option ARMs RMBS Loss Projection Update: February 2009 (SF155232)
- Rating Methodology Update: U.S. CMBS Review prompted by Declining Property Values and Rising Delinquencies, February 2009 (SF155011)
- Structured Finance CDO Ratings Surveillance Brief – Fourth Quarter 2008, January 2009 (SF154446)
- Moody's updates key assumptions for rating corporate synthetic CDOs, January 2009
- FAQs Regarding Current State of the Structured Investment Vehicle Market, January 2008 (SF120747)
- Moody's Update on Structured Investment Vehicles, January 2008 (SF118144)
- EMEA Asset-Backed Securities and Residential Mortgage-Backed Securities: 2008 Review and 2009 Outlook, January 2009 (SF152726)
- 2008 Review and 2009 Outlook EMEA CMBS: Limited primary issuance and credit market turmoil affecting transaction performance, January 2009 (SF152982)
- 2008 Review and 2009 Outlook Japan's Securitization Market, January 2009 (SF153614)
- 2008 Review and 2009 Outlook Australian Structured Finance: Global Financial Crisis Takes Toll, Difficult Year Ahead, February 2009 (SF152639)

*To access any of these reports, click on the entry above. Note that these references are current as of the date of publication of this report and that more recent reports may be available. All research may not be available to all clients.*

Report Number: 115157

**Author**

Julia Tung  
Debjani Dutta Roy  
Hadas Alexander

**Senior Production Associate**

Jason Lee  
Wing Chan  
Cassina Brooks



**Moody's Investors Service**

## SPECIAL COMMENT

# Structured Finance Rating Transitions: 1983-2009

## Table of Contents:

---

**Summary**

This report comprises Moody's eighth annual global structured finance rating transitions study. We review the 2009 and historical transition rates both on an aggregate basis and within key asset classes and provide comparisons to the corporate rating transition experience.

- » The 12-month downgrade rate for the global structured finance market rose to 56% in 2009 from 36% in 2008, while the upgrade rate decreased from 0.7% to 0.6%. Overall, 56,292 ratings from 8,714 deals were downgraded and 655 ratings from 280 deals were upgraded.
- » The average severity of downgrades, measured as the average number of notches the rating of a downgraded security was lowered over the year, fell by one notch from 8.3 notches in 2008 to 7.3 notches in 2009. At the same time, the average magnitude of upgrades rose moderately from 2.1 notches to 2.5 notches.
- » As a result of the heavy downgrade activity over the last few years, a significant portion of structured finance securities were rated Caa or lower as of the end of 2009. This was particularly true for transactions that closed between 2005 and 2007.
- » As in the prior two years, RMBS, HEL, and CDOs accounted for the majority of downgrades in 2009 (88% combined). Moody's conducted a number of rating surveillance "sweeps" of various asset types, including CLOs and RMBS backed by jumbo and Alt-A mortgages, throughout the year in order to align ratings with our updated methodology, outlook, and loss assumptions.
- » Declines in commercial property prices and changes in our surveillance methodology also caused heightened levels of downgrade activity among US CMBS. Transactions backed by US consumer assets were also negatively impacted by the weak US economy and elevated unemployment rates.
- » While downgrades in EMEA, the Asia-Pacific, and Latin America were less frequent than in the US, negative migration rates were high relative to their historical averages, a reflection of the global nature of the economic downturn.

## Analyst Contacts:

**Figure 1: Global Structured Finance 12-Month Downgrade and Upgrade Rates by Sector in 2009, 2008, and Averaged over 2000-2009**

|  | 12-month Downgrade Rate |       |           | 12-month Upgrade Rate |      |           |
|--|-------------------------|-------|-----------|-----------------------|------|-----------|
|  | 2009                    | 2008  | 2000-2009 | 2009                  | 2008 | 2000-2009 |
| US ABS ex HEL  | 23.4%                   | 16.9% | 8.1%      | 3.6%                  | 0.3% | 1.7%      |
| US Autos   | 19.9%                   | 20.2% | 3.7%      | 7.0%                  | 1.1% | 4.8%      |
| US Credit Cards  | 13.5%                   | 4.4%  | 2.4%      | 4.5%                  | 0.0% | 2.1%      |
| US Student Loans   | 25.0%                   | 24.1% | 5.8%      | 2.6%                  | 0.0% | 1.0%      |
| US Equipment Lease   | 9.3%                    | 5.6%  | 5.6%      | 1.2%                  | 4.7% | 2.6%      |
| US HEL (includes subprime)                                   | 47.4%                   | 54.7% | 24.6%     | 0.2%                  | 0.1% | 0.8%      |
| excl '05-'07 vintages  | 41.2%                   | 23.8% | 8.1%      | 0.5%                  | 0.2% | 1.2%      |
| US RMBS (includes Alt-A, Jumbo)                              | 74.7%                   | 37.2% | 19.7%     | 0.1%                  | 0.0% | 1.1%      |
| excl '05-'07 vintages  | 40.6%                   | 6.5%  | 3.9%      | 0.3%                  | 0.1% | 1.9%      |
| US CMBS  | 39.9%                   | 4.3%  | 8.5%      | 0.9%                  | 4.7% | 7.9%      |
| US CDOs  | 66.8%                   | 48.1% | 25.4%     | 0.6%                  | 0.6% | 1.1%      |
| excl US SF CDOs  | 77.4%                   | 18.1% | 17.0%     | 0.9%                  | 1.1% | 1.3%      |
| US HY CBOs   | 37.8%                   | 5.1%  | 15.7%     | 0.5%                  | 1.5% | 2.9%      |
| US CLOs  | 85.8%                   | 2.4%  | 15.3%     | 0.3%                  | 1.7% | 1.0%      |
| US SF CDOs   | 51.3%                   | 90.6% | 43.3%     | 0.2%                  | 0.0% | 0.7%      |
| US Synthetic Arbitrage CDOs                                  | 77.3%                   | 61.5% | 29.3%     | 1.2%                  | 0.0% | 0.3%      |
| US Structured Finance  | 58.6%                   | 38.1% | 18.6%     | 0.6%                  | 0.6% | 1.9%      |
| EMEA Structured Finance                                      | 39.7%                   | 18.9% | 10.4%     | 1.0%                  | 1.0% | 2.5%      |
| Asia Pacific Structured Finance                              | 25.4%                   | 7.7%  | 4.1%      | 1.5%                  | 2.5% | 3.8%      |
| Latin America Structured Finance                             | 17.0%                   | 18.0% | 9.8%      | 0.7%                  | 3.1% | 5.9%      |
| Global Structured Finance                                    | 56.0%                   | 35.6% | 17.4%     | 0.6%                  | 0.7% | 2.0%      |
| excl SF CDOs, Other SF, and '05-'07<br>vintage US HEL & RMBS | 41.2%                   | 12.2% | 7.7%      | 1.2%                  | 1.3% | 2.6%      |
| Global Corporate   | 32.9%                   | 20.5% | 16.7%     | 4.7%                  | 5.2% | 10.7%     |

## An Overview of Rating Transitions in 2009

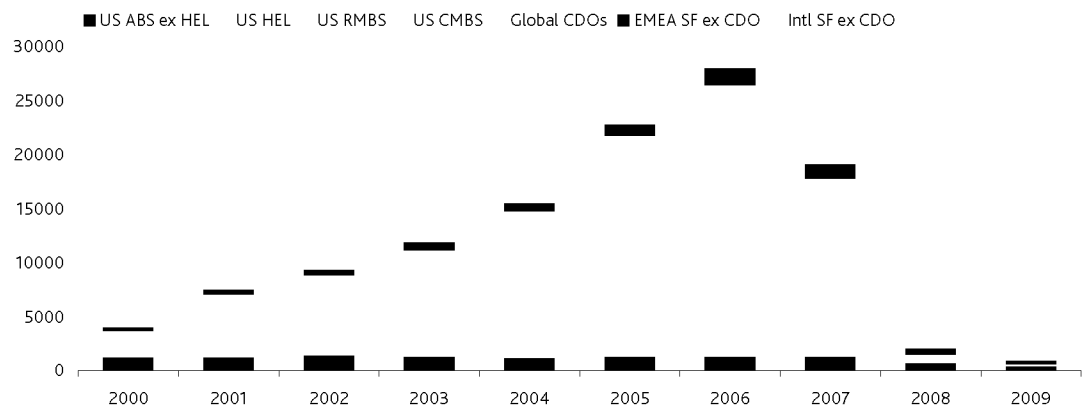
As global macroeconomic conditions remained weak in 2009, heavy downgrade activity for the structured finance market continued throughout the year. While US residential mortgage-backed securities and their derivatives still accounted for the largest share of negative rating actions, almost all asset types experienced heightened levels of downgrades from collateralized loans obligations (CLOs) to securitizations of US student loans. Moody's conducted a number of rating surveillance "sweeps" of various asset types throughout the year in order to align ratings with our updated methodology, outlook, and loss assumptions. We continue to maintain a negative outlook in most structured finance sectors and will review and revise our monitoring assumptions as needed.

In this section we discuss rating transitions for the global structured finance market, excluding derivative securities such as structured notes and repackaged securities. Detailed rating transitions data for the major sectors in the US (ABS excluding HEL, HEL, RMBS, CMBS, and CDOs) and the other structured finance category are presented later in the report. Rating transitions in EMEA (Europe, the Middle East, and Africa), the Asia-Pacific region and Latin America<sup>1</sup>, as well as global repackaged securities and structured notes, are also analyzed later in the report. Multi-year transition matrices can be found in Appendix III. The Appendices also contain a description of the data sample, glossary, and an explanation of calculation methods used in the report.

Structured finance issuance continued to decline in 2009, down 56% by rating count from 2008 (54% by volume) and down 96% from the peak in 2006 (80% by volume) (Figures 2 and 3). The contraction was seen in all sectors, but was especially severe for US mortgage-backed securities (US HEL and RMBS), which made up only 4% of total issuance in 2009 versus a peak of 69% in 2005. US ABS, excluding HEL, claimed the largest share of new ratings in 2009 at 35%, but in terms of issuance volume, EMEA structured finance, excluding CDOs, was the clear leader, accounting for 56% of new issuance.

FIGURE 2

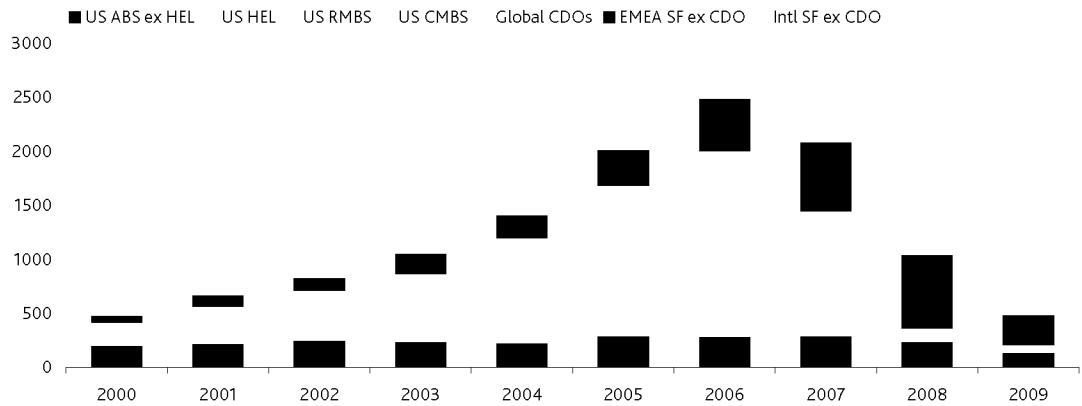
### Structured Finance Issuance by Rating Count per Closing Year



Note: Data includes Moody's-rated securities only and excludes the Other Structured Finance category.

<sup>1</sup> Moody's also publishes separate rating transition studies for EMEA, Japan, and the Asia Pacific region ex-Japan (forthcoming).

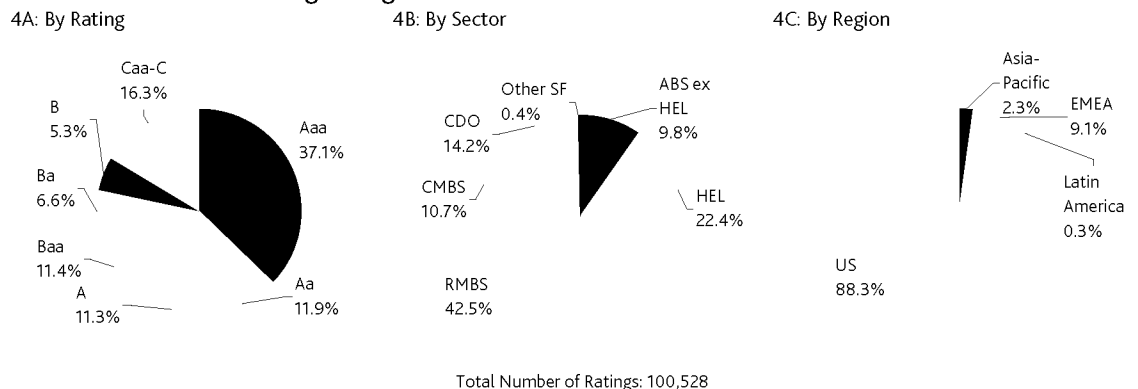
**FIGURE 3**  
**Structured Finance Issuance by Volume (US\$ billions) per Closing Year**



Note: Data includes Moody's-rated securities only and excludes the Other Structured Finance category.

At the beginning of 2009, there were 100,528 global structured finance ratings outstanding from 14,703 deals. While Aaa ratings were still the most prevalent, because of the large number of downgrades taken in 2008, the share of Aaa securities declined from 50% in the beginning of 2008 to 37% in the beginning of 2009 (Figure 4A). Moreover, the share of investment-grade securities dropped to 72% from 88% the previous year and the percentage of securities rated Caa or below grew from less than 4% to 16%. RMBS and HEL still accounted for the largest percentage of outstanding securities (65% combined), followed by CDOs (14%), CMBS (11%), and US ABS ex HEL (10%) (Figure 4B). Structured finance ratings were still heavily concentrated in the US,<sup>2</sup> which comprised 88% of outstanding ratings (Figure 4C).

**FIGURE 4**  
**Distribution of Outstanding Ratings on 1/1/2009**

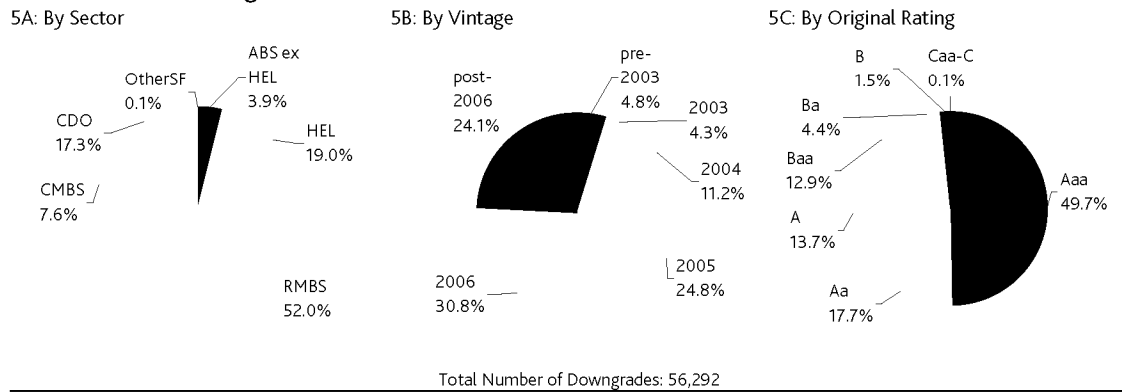


<sup>2</sup> Canadian structured finance securities are included in the US total. There were 322 Canadian structured finance ratings outstanding as of 1/1/2009 representing only 0.36% of the US total.

Over the course of 2009, 56,292 ratings from 8,714 deals were downgraded and 655 ratings from 280 deals were upgraded in the global structured finance market. As in the prior two years, downgrades were heavily concentrated in a few sectors and vintages. RMBS (52%), HEL (19%) and CDOs (17%) together accounted for 88% of all downgrades (Figure 5A) and securities that were issued in 2005 and later were responsible for 80% of negative rating activity (Figure 5B). For many deals, collateral performance has deteriorated or is expected to deteriorate to the extent that even the senior tranches were affected as evidenced by the fact that around half of the downgrades in 2009 involved securities that were originally rated Aaa (Figure 5C).

FIGURE 5

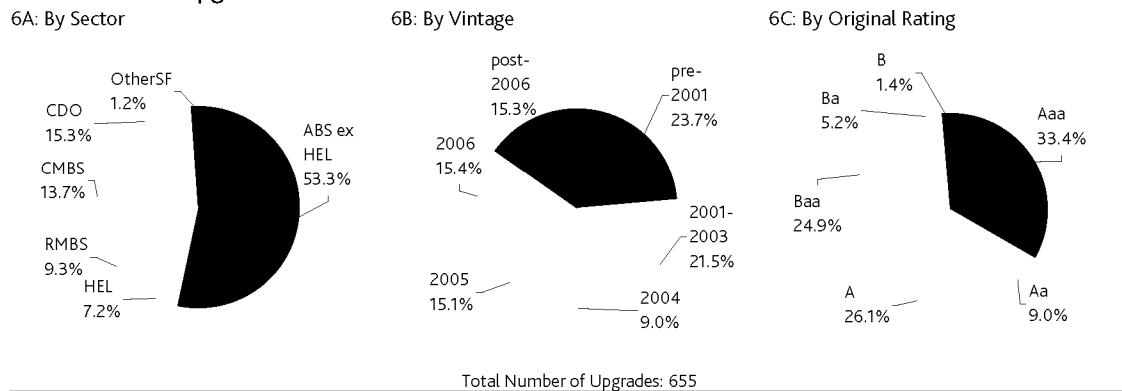
Distribution of Downgrades in 2009



Unlike the past 4 years when CMBS led upgrade activity, ABS, excluding HEL, was the largest source of upgrades (53%) in 2009 (Figure 6A). Unlike downgrades, there was no particular vintage that dominated upgrades and securities that were issued prior to 2005 had a similar chance to be upgraded as a security issued after 2004 (Figure 6B). Surprisingly, securities initially rated Aaa also accounted for the largest percentage of upgrades (33%) (Figure 6C). This was due to the fact that many of the tranches were originally wrapped and were downgraded after the downgrade of the guarantor, but were subsequently able to achieve a rating higher than that of their guarantor.<sup>3</sup> Most positive rating changes that occurred in 2009 were not caused by strong collateral performance, but for other reasons such as increased credit enhancement and/or structural features.

FIGURE 6

Distribution of Upgrades in 2009



<sup>3</sup> According to Moody's policy, securities insured by financial guarantors are rated at the higher of the guarantor's insurance financial strength rating and the underlying rating, which reflects the intrinsic credit quality of the bonds in the absence of the guarantee.



### Analysis of Rating Transition Trends

The 12-month downgrade rate increased to 56% in 2009 from 36% in 2008, while the 12-month upgrade rate dipped down to 0.6% compared to 0.7% the previous year (Figures 7A and 7E). The average magnitude of rating downgrades, measured as the average number of notches changed in the course of a 12-month period per downgraded security, rose to 10.5 notches in the first quarter of 2009, but declined to 7.3 notches for the full-year 2009 (Figure 7B). There was much less movement in the average magnitude of upgrades which grew from 2.1 notches in 2008 to 2.5 notches in 2009.

Both the fallen angel rate, defined as the rate at which investment-grade securities are downgraded to non-investment grade, and the Aaa downgrade rate followed the same pattern exhibited by the overall downgrade rate, rising to a new high in early 2009 and then falling by the end of the year. The Aaa downgrade rate for 2009 was 45% compared to 26% the year prior and the fallen angel increased to 35% from 19% (Figure 7C).

Figure 7D shows the cumulative transition rates of securities issued between 1983 and 2009. It compares the original rating of the tranche to its rating as of 12/31/09 (or to its last rating prior to withdrawal). Cumulative downgrade rates increased as the rating category declined such that Aaa ratings were the most stable and securities originally rated Ba experienced the highest cumulative downgrade rate. The single-B rating category was the only exception to this rule, but this category is much less common in some sectors than in others, e.g. there are relatively few B-rated tranches issued for subprime transactions, while this rating category is very common for US CMBS.

Figure 7: Global Structured Finance Rating Transition Trends

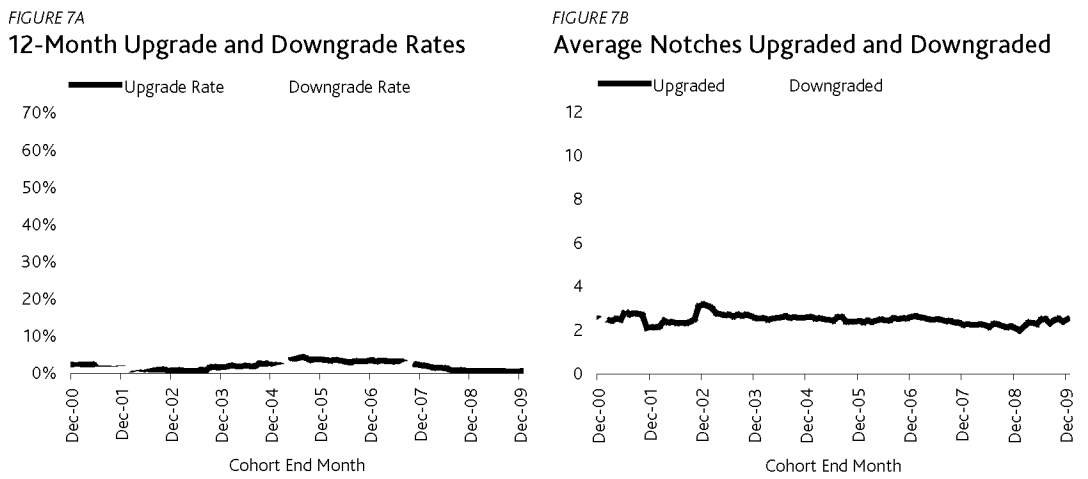


FIGURE 7C

## Fallen Angel Rate and Aaa Downgrade Rate

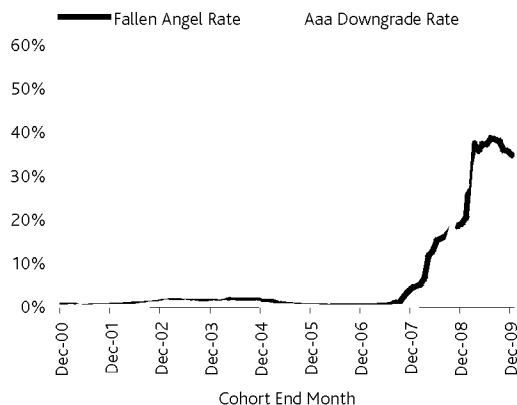
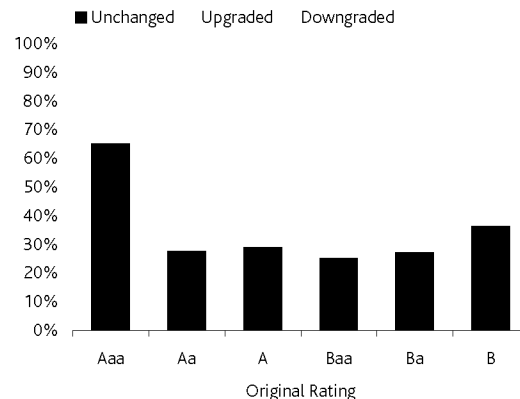


FIGURE 7D

## Cumulative Upgrade and Downgrade Rates



## Figure 7E: Summary of Rating Transition Trends

|  | 2009     | 2008     | 2000-2009 | 2000-2008 |
|--|----------|----------|-----------|-----------|
| Downgrade Rate                           | 55.95%   | 35.56%   | 17.45%    | 7.70%     |
| Upgrade Rate                             | 0.65%    | 0.69%    | 1.97%     | 2.31%     |
| Downgrade/Upgrade Ratio                  | 86.14    | 51.74    | 8.85      | 3.34      |
| Downgrade Rate (Notch Weighted)          | 411.11%  | 295.20%  | 143.31%   | 55.43%    |
| Upgrade Rate (Notch Weighted)            | 1.63%    | 1.45%    | 4.86%     | 5.71%     |
| Downgrade/Upgrade Ratio (Notch Weighted) | 252.31   | 203.39   | 29.47     | 9.71      |
| Rating Drift (Notch Weighted)            | -409.48% | -293.75% | -138.45%  | -49.72%   |
| Rating Volatility (Notch Weighted)       | 412.74%  | 296.66%  | 148.18%   | 61.14%    |
| Stability Rate                           | 43.40%   | 63.75%   | 80.58%    | 89.99%    |
| Average Number of Notches Downgraded     | 7.35     | 8.30     | 8.21      | 7.20      |
| Average Number of Notches Upgraded       | 2.51     | 2.11     | 2.47      | 2.47      |

## Comparison to Structured Finance Rating Transitions excluding SF CDOs, Others, and 2005-2007 vintage US HEL and RMBS

By excluding SF CDOs, the other structured finance category, and 2005 to 2007 vintage US HEL and RMBS, the 12-month downgrade rate for 2009 decreases 15 percentage points to 41% (Figure 8A). The frequency of fallen angels and Aaa downgrades also decreases significantly from 35% to 16% and 45% to 24%, respectively (Figure 8C) when those same categories are excluded. In addition, the average severity of downgrades is significantly lower without these poorly performing transactions as the average magnitude of downgrades peaks at 6.1 notches compared to the peak of 10.5 notches for global structured finance (Figure 8B).

The stability rate of Aaa ratings improves to 86% versus 65% when these asset types and vintages are removed (Figure 8D). Cumulative downgrade rates for the other investment grade rating categories also decline by 18 to 24 percentage points and the frequency of upgrades increases for all rating categories.

Figure 8: Global Structured Finance (excl SF CDOS, Other, and '05-'07 Vintage US HEL and RMBS) Rating Transition Trends

FIGURE 8A

12-Month Upgrade and Downgrade Rates

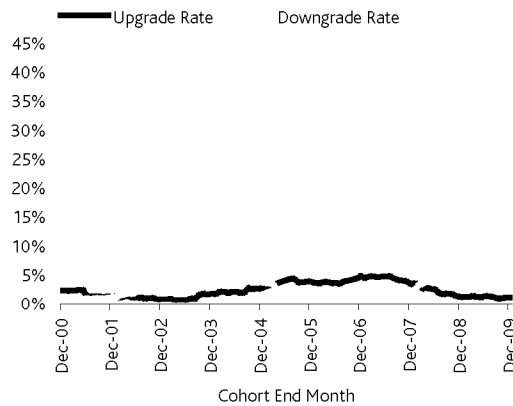


FIGURE 8B

Average Notches Upgraded and Downgraded

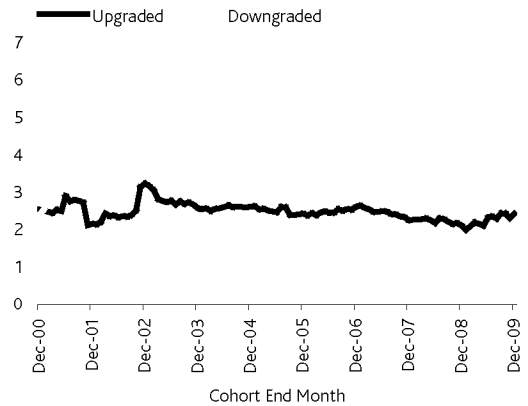


FIGURE 8C

Fallen Angel Rate and Aaa Downgrade Rate

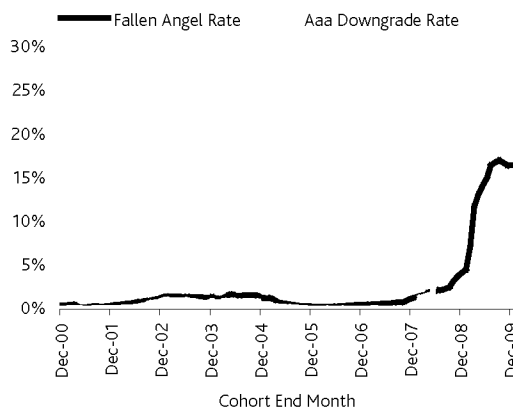


FIGURE 8D

Cumulative Upgrade and Downgrade Rates

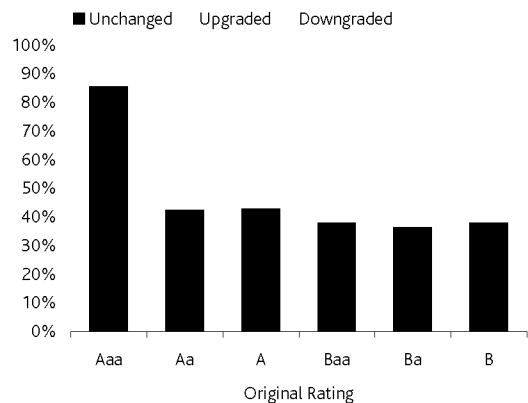


Figure 8E: Summary of Rating Transition Trends

|  | 2009     | 2008    | 2000-2009 | 2000-2008 |
|--|----------|---------|-----------|-----------|
| Downgrade Rate                           | 41.15%   | 12.24%  | 7.65%     | 3.32%     |
| Upgrade Rate                             | 1.17%    | 1.31%   | 2.64%     | 2.88%     |
| Downgrade/Upgrade Ratio                  | 35.17    | 9.37    | 2.90      | 1.15      |
| Downgrade Rate (Notch Weighted)          | 215.62%  | 64.34%  | 39.20%    | 13.99%    |
| Upgrade Rate (Notch Weighted)            | 2.86%    | 2.77%   | 6.51%     | 7.16%     |
| Downgrade/Upgrade Ratio (Notch Weighted) | 75.48    | 23.24   | 6.02      | 1.96      |
| Rating Drift (Notch Weighted)            | -212.76% | -61.57% | -32.69%   | -6.84%    |
| Rating Volatility (Notch Weighted)       | 218.48%  | 67.11%  | 45.71%    | 21.15%    |
| Stability Rate                           | 57.68%   | 86.46%  | 89.71%    | 93.80%    |
| Average Number of Notches Downgraded     | 5.24     | 5.26    | 5.12      | 4.22      |
| Average Number of Notches Upgraded       | 2.44     | 2.12    | 2.47      | 2.48      |

## Transitions to Caa and Below

Since securities that are downgraded to Caa and below are at high risk of incurring losses, it is instructive to examine migrations to this lowest rating category. Figure 9 shows the transition rate into Caa and below for each broad initial rating category broken out by vintage. The rates are calculated as a percentage of both the original amount issued and the number of ratings issued.

We see that securities issued prior to 2005 experienced relatively low migration rates to Caa and below at 2.5% by volume and 6.6% by rating count. Only around 1% of Aaa tranches from these early vintages were downgraded to low levels. These numbers increase sharply for the 2005 vintage and are significantly higher for the 2006 and 2007 vintages where over half the securities that closed in those years (by count) were rated below single-B as of the end of 2009. By rating count, the 2008 vintage had a higher frequency of downgrade to Caa and lower than the pre-2005 vintages. Most of the downgraded securities were US resecuritized RMBS, where rating actions have been triggered by changes in the ratings of the underlying securities, and CMBS, where commercial property prices remain stressed and surveillance assumptions were revised.

**Figure 9: Downgrades to Caa and Lower by Original Rating and Vintage (as of 12/31/09)**

| <b>By Percentage of Original Balance Issued</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Total</b> |
|---|------------|-----------|----------|------------|-----------|----------|--------------|
| Pre-2005 Vintages                               | 1.3%       | 4.9%      | 8.8%     | 16.8%      | 28.9%     | 41.3%    | 2.5%         |
| 2005 Vintage                                    | 7.4%       | 24.2%     | 31.7%    | 41.8%      | 72.2%     | 46.7%    | 10.8%        |
| 2006 Vintage                                    | 24.3%      | 55.6%     | 43.3%    | 41.0%      | 61.4%     | 52.9%    | 27.7%        |
| 2007 Vintage                                    | 20.0%      | 44.4%     | 34.5%    | 29.2%      | 67.1%     | 82.5%    | 22.4%        |
| 2008 Vintage                                    | 0.3%       | 0.2%      | 9.6%     | 5.4%       | 13.1%     | 57.8%    | 1.3%         |

| <b>By Percentage of Number of Ratings Issued</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Total</b> |
|--|------------|-----------|----------|------------|-----------|----------|--------------|
| Pre-2005 Vintages                                | 1.0%       | 5.2%      | 9.8%     | 26.1%      | 31.7%     | 41.9%    | 6.6%         |
| 2005 Vintage                                     | 10.3%      | 31.6%     | 51.0%    | 68.5%      | 73.1%     | 62.1%    | 30.2%        |
| 2006 Vintage                                     | 38.8%      | 68.7%     | 72.1%    | 72.8%      | 83.1%     | 74.4%    | 56.5%        |
| 2007 Vintage                                     | 40.9%      | 67.1%     | 64.7%    | 64.2%      | 74.4%     | 77.0%    | 53.9%        |
| 2008 Vintage                                     | 4.8%       | 4.2%      | 5.2%     | 7.2%       | 27.7%     | 57.1%    | 7.9%         |

Note: Data does not include the Other Structured Finance category.

## Comparison to Corporate Rating Transitions

While downgrade activity for both the structured finance and corporate finance markets<sup>4</sup> rose in 2009, the downgrade rate for structured finance was still much higher than that of the corporate sector (Figure 10A). Prior to 2008, the opposite was true with corporate issuers exhibiting less stability than structured finance securities. In addition, the gap between the average notches downgraded for the two sectors has widened significantly (Figure 10B). The average magnitude of downgrades for the corporate sector has consistently been around 2 notches in the last decade, which is 5.3 notches lower than the average for structured finance in 2009.

<sup>4</sup> The structured finance and corporate transition statistics presented in this section use different methodologies in treating rating withdrawals. The structured finance statistics use the rating before WR as the end rating, while the corporate statistics exclude non-defaulted withdrawn ratings from the calculation. In addition, defaults are treated as downgrades for the corporate sector.

Figure 10: Rating Transition Trends for Corporate and Structured Finance

FIGURE 10A

12-Month Downgrade Rates

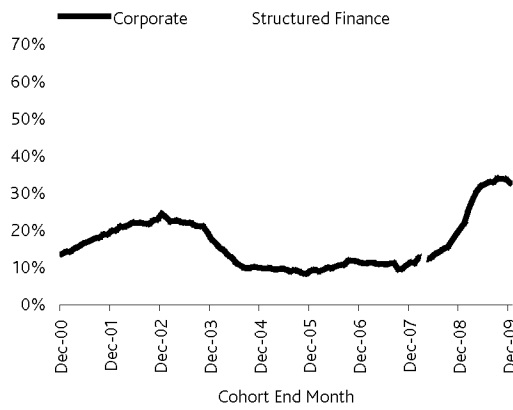


FIGURE 10B

Average Notches Downgraded

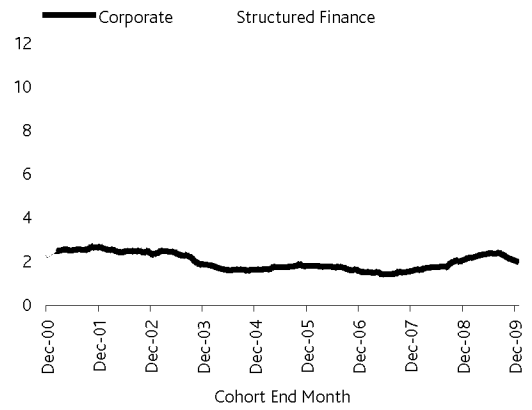


FIGURE 10C

12-Month Upgrade Rates

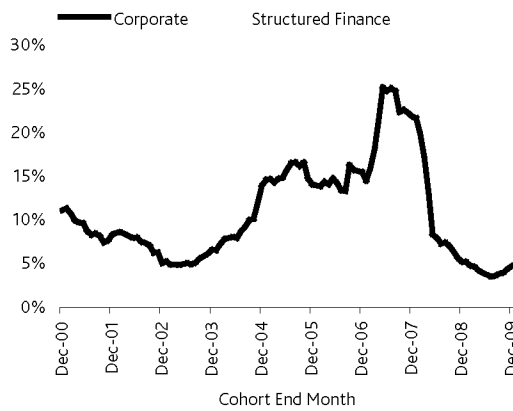


FIGURE 10D

Average Notches Upgraded

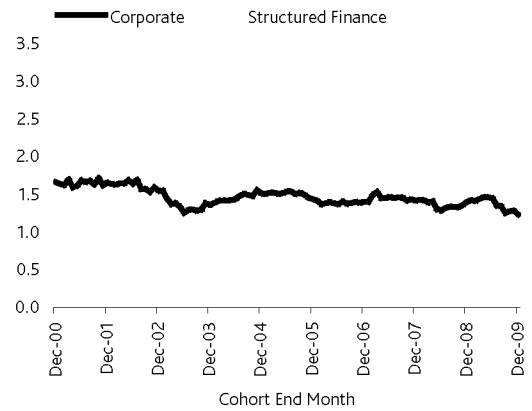


Figure 10E: Summary of Rating Transition Trends

|  | Structured Finance |          |           | Corporate Finance |         |           |
|--|--------------------|----------|-----------|-------------------|---------|-----------|
|  | 2009               | 2008     | 1984-2009 | 2009              | 2008    | 1984-2009 |
| Downgrade Rate                           | 55.95%             | 35.56%   | 14.38%    | 32.87%            | 20.47%  | 15.35%    |
| Upgrade Rate                             | 0.65%              | 0.69%    | 1.98%     | 4.70%             | 5.23%   | 9.51%     |
| Downgrade/Upgrade Ratio                  | 86.14              | 51.74    | 7.26      | 7.00              | 3.92    | 1.61      |
| Downgrade Rate (Notch Weighted)          | 411.11%            | 295.20%  | 116.75%   | 66.96%            | 43.04%  | 33.76%    |
| Upgrade Rate (Notch Weighted)            | 1.63%              | 1.45%    | 4.68%     | 5.82%             | 7.32%   | 14.45%    |
| Downgrade/Upgrade Ratio (Notch Weighted) | 252.31             | 203.39   | 24.94     | 11.51             | 5.88    | 2.34      |
| Rating Drift (Notch Weighted)            | -409.48%           | -293.75% | -112.07%  | -61.15%           | -35.71% | -19.32%   |
| Rating Volatility (Notch Weighted)       | 412.74%            | 296.66%  | 121.43%   | 72.78%            | 50.36%  | 48.21%    |
| Stability Rate                           | 43.40%             | 63.75%   | 83.64%    | 62.43%            | 74.30%  | 75.14%    |
| Average Number of Notches Downgraded     | 7.35               | 8.30     | 8.12      | 2.04              | 2.10    | 2.20      |
| Average Number of Notches Upgraded       | 2.51               | 2.11     | 2.36      | 1.24              | 1.40    | 1.52      |

Upgrade rates remained low compared to the historical average for both sectors, while the average size of upgrades was similar to the historical experience (Figures 10C and 10D).

Figure 11 compares the 12-month rating transition matrices for global structured finance and global corporate finance in 2009 and averaged over the period 1984 to 2009. For the 2009 cohort, structured finance securities have been significantly less stable and have experienced much more frequent transitions to the speculative-grade rating categories. On a historical basis, Aaa structured finance ratings have been slightly more stable than their corporate counterparts, but experienced significantly higher negative migration rates to Caa-C.

**Figure 11: Global Structured Finance and Corporate Finance 12-month Rating Transition Matrices**

| <b>Structured Finance in 2009</b>    | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
|--------------------------------------|------------|-----------|----------|------------|-----------|----------|--------------|
| Aaa                                  | 55.42%     | 10.41%    | 7.14%    | 6.06%      | 5.04%     | 5.75%    | 10.18%       |
| Aa                                   | 0.69%      | 37.23%    | 15.89%   | 12.79%     | 9.01%     | 8.53%    | 15.86%       |
| A                                    | 0.55%      | 1.06%     | 32.57%   | 14.71%     | 14.67%    | 12.32%   | 24.10%       |
| Baa                                  | 0.12%      | 0.24%     | 0.53%    | 32.45%     | 12.94%    | 18.64%   | 35.09%       |
| Ba                                   | 0.03%      | 0.02%     | 0.08%    | 1.14%      | 23.31%    | 14.69%   | 60.74%       |
| B                                    | 0.02%      | 0.02%     | 0.02%    | 0.06%      | 0.17%     | 19.36%   | 80.36%       |
| Caa-C                                |            |           |          | 0.02%      | 0.01%     | 0.04%    | 99.92%       |
| <b>Structured Finance: 1984-2009</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
| Aaa                                  | 91.95%     | 1.67%     | 1.27%    | 1.13%      | 0.90%     | 1.09%    | 1.99%        |
| Aa                                   | 4.54%      | 79.41%    | 3.64%    | 2.34%      | 1.77%     | 2.50%    | 5.80%        |
| A                                    | 1.00%      | 2.90%     | 78.12%   | 4.87%      | 2.81%     | 2.94%    | 7.35%        |
| Baa                                  | 0.34%      | 0.43%     | 2.16%    | 75.81%     | 4.68%     | 4.42%    | 12.18%       |
| Ba                                   | 0.13%      | 0.06%     | 0.35%    | 2.21%      | 70.85%    | 4.83%    | 21.57%       |
| B                                    | 0.05%      | 0.03%     | 0.05%    | 0.22%      | 1.24%     | 59.41%   | 39.00%       |
| Caa-C                                | 0.01%      |           | 0.00%    | 0.03%      | 0.04%     | 0.22%    | 99.69%       |
| <b>Corporate Finance in 2009</b>     | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
| Aaa                                  | 64.90%     | 35.10%    |          |            |           |          |              |
| Aa                                   |            | 75.00%    | 23.75%   | 1.09%      | 0.16%     |          |              |
| A                                    |            | 0.19%     | 85.44%   | 13.17%     | 0.46%     | 0.56%    | 0.19%        |
| Baa                                  |            | 0.10%     | 1.07%    | 91.63%     | 5.45%     | 0.88%    | 0.88%        |
| Ba                                   |            |           |          | 3.83%      | 78.16%    | 14.37%   | 3.64%        |
| B                                    |            |           |          |            | 3.03%     | 74.89%   | 22.08%       |
| Caa-C                                |            |           |          |            |           | 7.58%    | 92.42%       |
| <b>Corporate Finance: 1984-2009</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
| Aaa                                  | 90.28%     | 9.35%     | 0.32%    | 0.01%      | 0.04%     | 0.00%    | 0.00%        |
| Aa                                   | 0.98%      | 89.98%    | 8.54%    | 0.39%      | 0.05%     | 0.02%    | 0.04%        |
| A                                    | 0.07%      | 2.91%     | 90.53%   | 5.74%      | 0.53%     | 0.11%    | 0.10%        |
| Baa                                  | 0.04%      | 0.21%     | 4.97%    | 88.86%     | 4.44%     | 0.98%    | 0.50%        |
| Ba                                   | 0.01%      | 0.06%     | 0.42%    | 6.36%      | 82.14%    | 8.89%    | 2.13%        |
| B                                    | 0.01%      | 0.04%     | 0.15%    | 0.39%      | 5.31%     | 81.91%   | 12.19%       |
| Caa-C                                |            | 0.02%     | 0.02%    | 0.22%      | 0.43%     | 8.83%    | 90.47%       |

Note: The Caa-C category for corporate finance includes defaults.

## Sector Specific Analysis of Rating Transitions

### US ABS ex HEL

The US ABS excluding HEL sector saw a total of 1,821 ratings from 550 deals downgraded and 283 ratings from 88 deals upgraded in 2009. Student loan ABS were the largest source of both downgrades (42%) and upgrades (28%) (Figures 12A and 12B). Securities backed by small business loans and manufactured housing loans accounted for the next largest share of downgrades at 11% each, followed by auto ABS<sup>5</sup> (10%) and credit card ABS (7%). Auto ABS was the second-largest contributor of upgrades (23%) followed closely by tobacco settlement deals (22%) and transactions backed by credit card receivables (16%).

FIGURE 12A

#### US ABS ex HEL Downgrades in 2009

By Asset Class

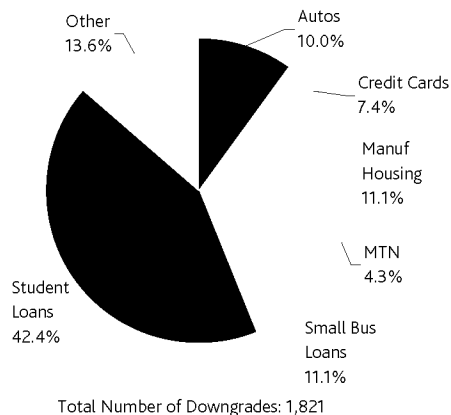
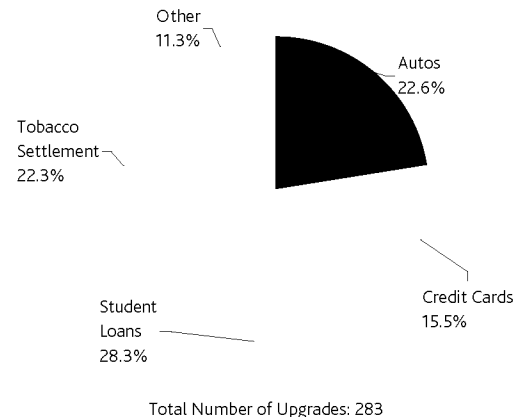


FIGURE 12B

#### US ABS ex HEL Upgrades in 2009

By Asset Class



Most of the student loan securities that were upgraded were originally wrapped and were able to achieve a rating higher than that of their guarantors. The upgrades of the tobacco settlement bonds involved deals sponsored by certain New York counties and were due to a favorable ruling in a case relating to tobacco settlements.<sup>6</sup> While collateral performance has generally worsened for auto and credit card ABS, some auto-loan backed securities were able to achieve upgrades because of a build-up in credit enhancement due to structural features of the transactions and some credit card-backed securities benefited from the decision of the issuer to increase credit enhancement for the classes.

Roughly 37% of the downgraded securities in 2009 were originally wrapped by a financial guarantor and were downgraded either because the financial guarantor was downgraded or due to the performance of the underlying assets (Figure 13A). Student loan ABS (53%), medium term note programs (12%), and auto ABS (11%) together comprised 76% of these wrapped downgrades.

The vast majority of the 1,155 downgrades of unwrapped securities were due to weak collateral performance (Figure 13B). A substantial portion of the student loan downgrades were prompted by the increase in funding costs due to the prolonged dislocation of the auction rate securities market. Downgrades of transactions backed by small business loans were concentrated in 2 issuers - Bayview

<sup>5</sup> Auto ABS includes securities backed by auto loans, auto leases, and auto dealer floorplan receivables.

<sup>6</sup> See Moody's Announcement, "[Moody's takes action on seven New York counties tobacco settlement deals](#)," January 16, 2009.

Commercial Asset Trust and Lehman Brothers Small Balance Commercial - and were caused mainly by an increase in delinquencies in the pools of the underlying loans. The most prevalent cause of downgrade for securities backed by manufactured housing loans, credit card receivables, and auto loans was continued deterioration in the performance of the underlying collateral.

FIGURE 13A

### Wrapped US ABS ex HEL Downgrades in 2009 By Asset Class

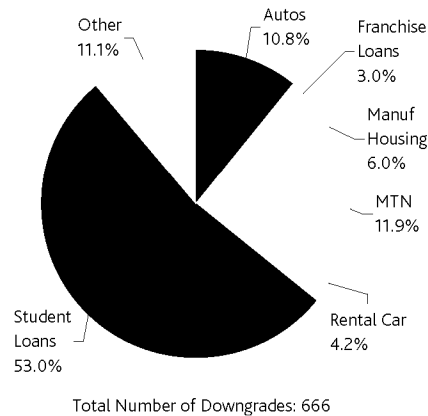
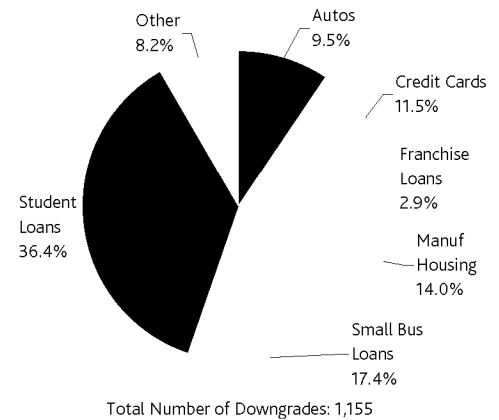


FIGURE 13B

### Non-wrapped US ABS ex HEL Downgrades in 2009 By Asset Class



For the US ABS excluding HEL sector in 2009 (see Figure 14):

- » The frequency of downgrades rose to 23.4% from 16.9% in 2008, while the upgrade rate increased to 3.6% from 0.3%.
- » The average magnitude of rating downgrades and upgrades both increased 0.3 notches on a year-over-year basis, from 4.7 notches to 5.0 for downgrades and 1.9 to 2.2 notches for upgrades.
- » The Aaa downgrade rate fell from 25.7% in 2008 to 12.7% in 2009. The elevated level of Aaa downgrades in the previous year was caused by the downgrades of many of the financial guarantors that were wrapping the ABS. However, the fallen angel rate increased in 2009 from 1.2% to 8.8%.
- » Securities originally rated Aaa maintained a stability rate of 84%, but all other rating categories have experienced cumulative transition rates to date of roughly 40%-60%. For all ratings, cumulative downgrade rates have exceeded cumulative upgrade rates to date.

Figure 15 plots the 12-month downgrade and upgrades rates for the major US ABS asset classes, excluding HEL. While downgrade rates started to decline toward the second half of 2009, they remain high compared to historical rates for autos, credit cards, and student loans. Auto ABS have historically experienced the highest upgrade rate among the major US ABS asset classes and this was also true in 2009. The frequency of upgrades for credit card and student loan transactions rose from negligible through most of 2008 and early 2009 to reach 4.5% for credit card ABS and 2.6% for student loan ABS by the end of 2009.



Figure 14: US ABS ex HEL Rating Transition Trends

FIGURE 14A

12-Month Upgrade and Downgrade Rates

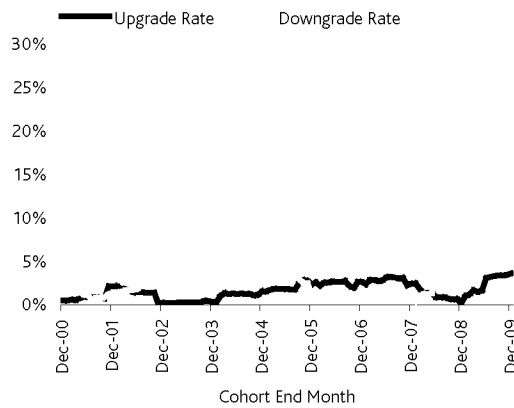


FIGURE 14B

Average Notches Upgraded and Downgraded

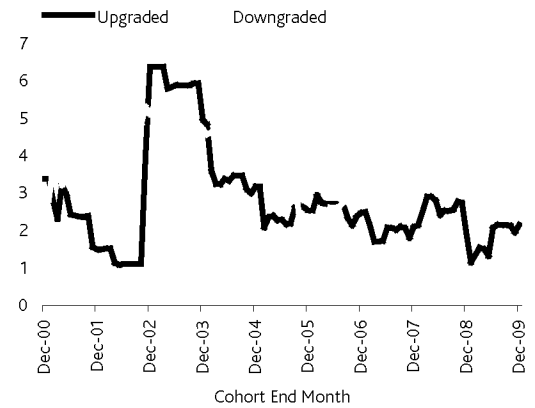


FIGURE 14C

Fallen Angel Rate and Aaa Downgrade Rate

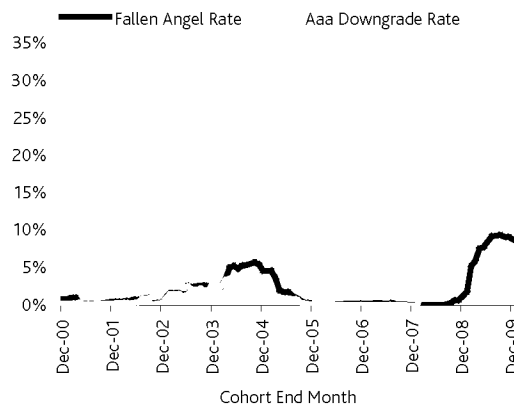


FIGURE 14D

Cumulative Upgrade and Downgrade Rates

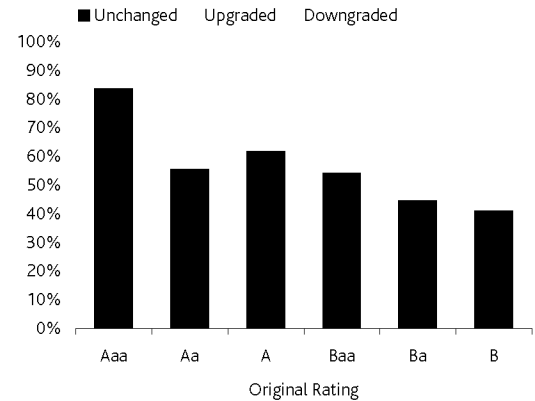
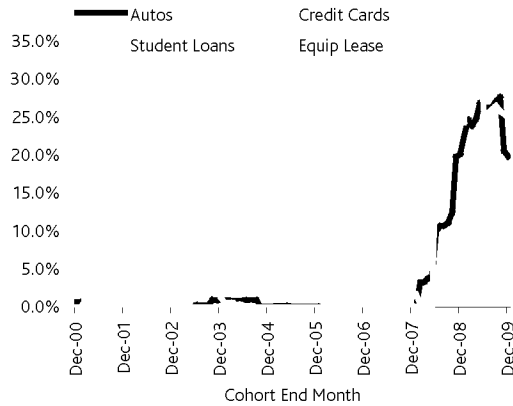


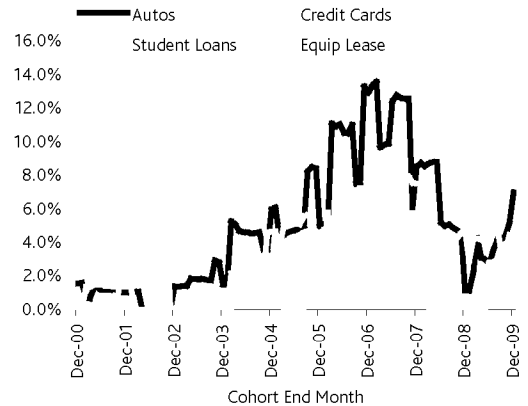
Figure 14E: Summary of Rating Transition Trends

|  | 2009     | 2008    | 2000-2009 | 2000-2008 |
|--|----------|---------|-----------|-----------|
| Downgrade Rate                           | 23.41%   | 16.90%  | 8.13%     | 5.82%     |
| Upgrade Rate                             | 3.65%    | 0.27%   | 1.72%     | 1.60%     |
| Downgrade/Upgrade Ratio                  | 6.42     | 61.50   | 4.73      | 3.64      |
| Downgrade Rate (Notch Weighted)          | 117.25%  | 79.91%  | 39.84%    | 26.48%    |
| Upgrade Rate (Notch Weighted)            | 7.87%    | 0.52%   | 4.04%     | 3.91%     |
| Downgrade/Upgrade Ratio (Notch Weighted) | 14.90    | 152.36  | 9.86      | 6.78      |
| Rating Drift (Notch Weighted)            | -109.38% | -79.38% | -35.80%   | -22.57%   |
| Rating Volatility (Notch Weighted)       | 125.12%  | 80.43%  | 43.88%    | 30.38%    |
| Stability Rate                           | 72.95%   | 82.83%  | 90.15%    | 92.58%    |
| Average Number of Notches Downgraded     | 5.01     | 4.73    | 4.90      | 4.55      |
| Average Number of Notches Upgraded       | 2.16     | 1.91    | 2.35      | 2.45      |

**FIGURE 15A**  
US ABS ex HEL 12-Month Downgrade Rates  
By Asset Class



**FIGURE 15B**  
US ABS ex HEL 12-Month Upgrade Rates  
By Asset Class

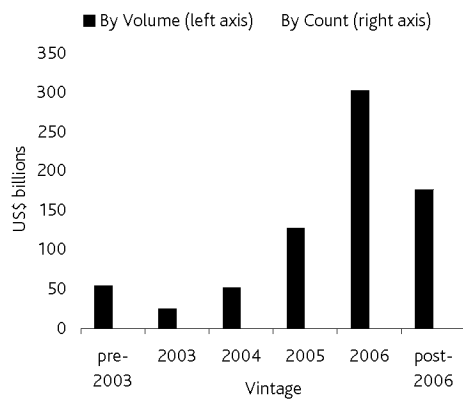


**US HEL and RMBS**

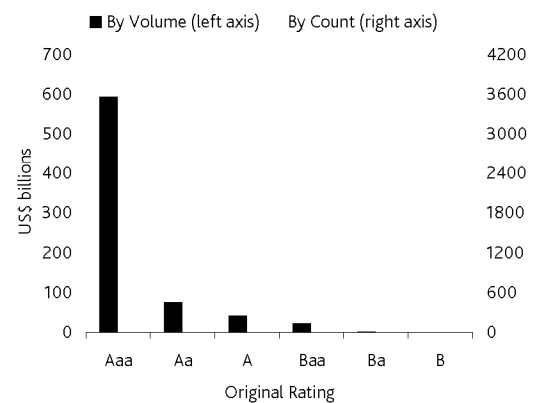
Falling US home prices and rising unemployment caused growing delinquencies and losses for securitized mortgage pools. In total, 10,696 US HEL tranches from 2,086 deals and 28,652 US RMBS tranches from 2,404 deals were downgraded in 2009. Upgrades were rare as only 47 US HEL classes from 27 transactions and 36 US RMBS classes from 29 deals were upgraded during the year.

For US HEL, which includes transactions backed by subprime mortgages, securities that were issued in 2006 were the top contributor of downgrades in 2009, both by volume (41%) and by count (30%) (Figure 16A). The 2005 vintage experienced a similar count of downgrades, but less than half the volume experienced by the 2006 vintage. Transactions that closed in 2007 and later had the third largest count of downgrades (16%), but the second largest in terms of volume (24%). Securities that were originally rated Aaa experienced the largest number and volume of downgrades and the other investment-grade rating categories experienced similar numbers of negative rating transitions (Figure 16B).

**FIGURE 16A**  
US HEL Downgrades in 2009 by Vintage



**FIGURE 16B**  
US HEL Downgrades in 2009 by Original Rating



While counter-intuitive, deterioration in collateral performance can be a driver of upgrades. The primary reason for the few US HEL upgrades that occurred in 2009 were that performance triggers were breached in the transaction causing a shift in the payment waterfall, which benefited some tranches in the deal.

For the US HEL sector in 2009 (see Figure 17):

- » The frequency of downgrades rose to 72% by the end of September 2009, but dropped to 47% for the cohort ending December 2009. The decrease was due to the fact that many rating actions had already been taken in 2008. The upgrade rate rose from 0.1% in 2008 to 0.2% in 2009.
- » After peaking in March 2009 at 10.4 notches, the average magnitude of rating downgrades declined steadily to 6.1 notches by the end of the year. The magnitude of upgrades rose to 4.6 notches from 1.8 notches the year prior.
- » The fallen angel rate and Aaa downgrade rate were remarkably similar to each other. Like the average severity of downgrades, they both hit a high at the end of the first quarter and then decreased through the rest of 2009.
- » Despite the fact that securities initially rated Aaa were the most downgraded in 2009, they still exhibited a stability rate of over 70% to date. Securities carrying original ratings of double-A or lower experienced cumulative downgrade rates in excess of 70%.

Figure 17: US HEL Rating Transition Trends

FIGURE 17A

12-Month Upgrade and Downgrade Rates

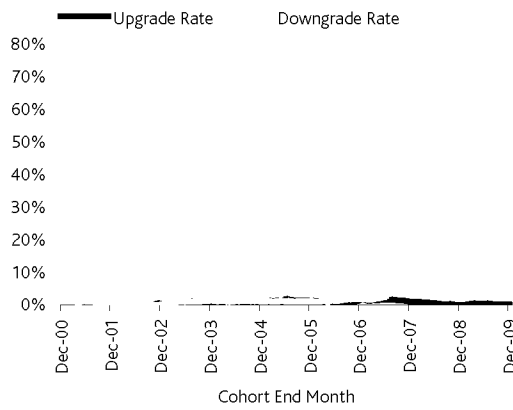


FIGURE 17B

Average Notches Upgraded and Downgraded

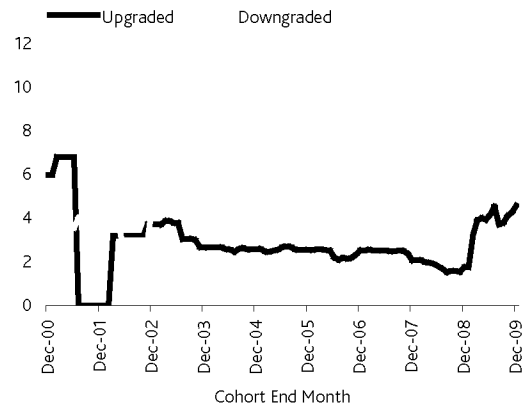


FIGURE 17C

Fallen Angel Rate and Aaa Downgrade Rate

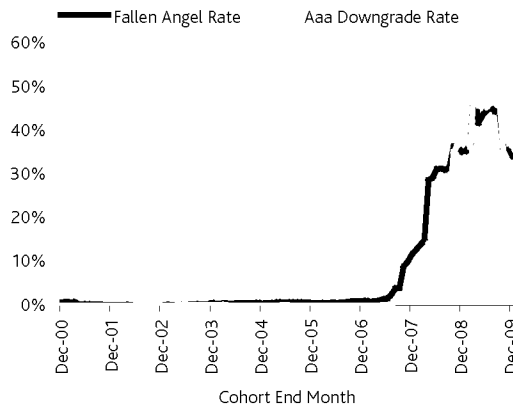


FIGURE 17D

Cumulative Upgrade and Downgrade Rates

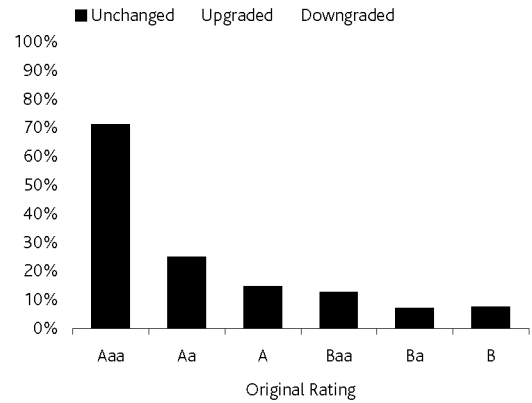


Figure 17E: Summary of Rating Transition Trends

|  | 2009     | 2008     | 2000-2009 | 2000-2008 |
|--|----------|----------|-----------|-----------|
| Downgrade Rate                           | 47.44%   | 54.65%   | 24.57%    | 14.32%    |
| Upgrade Rate                             | 0.21%    | 0.06%    | 0.78%     | 0.89%     |
| Downgrade/Upgrade Ratio                  | 227.57   | 850.50   | 31.63     | 16.02     |
| Downgrade Rate (Notch Weighted)          | 290.93%  | 487.41%  | 189.07%   | 109.22%   |
| Upgrade Rate (Notch Weighted)            | 0.95%    | 0.11%    | 2.02%     | 2.18%     |
| Downgrade/Upgrade Ratio (Notch Weighted) | 305.07   | 4334.14  | 93.74     | 50.00     |
| Rating Drift (Notch Weighted)            | -289.98% | -487.30% | -187.05%  | -107.04%  |
| Rating Volatility (Notch Weighted)       | 291.88%  | 487.53%  | 191.08%   | 111.40%   |
| Stability Rate                           | 52.35%   | 45.28%   | 74.65%    | 84.79%    |
| Average Number of Notches Downgraded     | 6.13     | 8.92     | 7.69      | 7.63      |
| Average Number of Notches Upgraded       | 4.57     | 1.75     | 2.60      | 2.44      |

Downgrades among US RMBS, which includes transactions backed by jumbo and Alt-A mortgages, followed a similar pattern as US HEL. However, while the 2006 vintage was again the top contributor of downgrades both by volume and count (32% for both), securities issued in 2005 were a close second and transactions that closed after 2006 were not far behind (Figure 18A). Downgrades were even more concentrated in Aaa ratings – 94% by volume and 66% by count - for US RMBS than for US HEL (Figure 18B).

FIGURE 18A

## US RMBS Downgrades in 2009 by Vintage

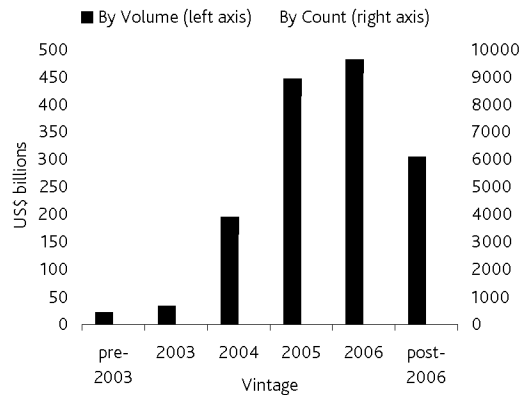
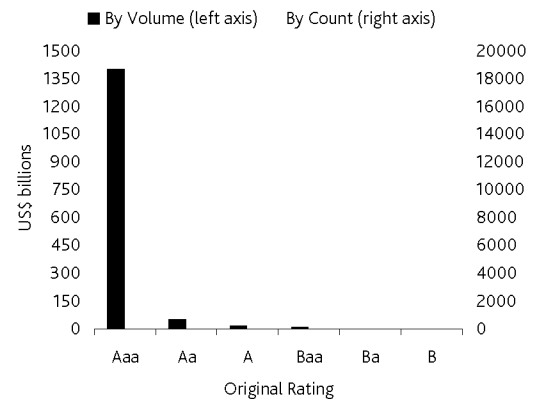


FIGURE 18B

## US RMBS Downgrades in 2009 by Original Rating



Seventy-two percent of the US RMBS upgrades in 2009 affected deals that closed prior to 1994. For most of these transactions, the pool factor is very low, which carries its own special risk, but seasoned deals can also benefit from a build-up of credit enhancement and/or borrowers with long payment histories.

For the US RMBS sector in 2009 (see Figure 19):

- » The frequency of downgrades increased from 37% in 2008 to 75% in 2009, the highest among all the major sectors. The upgrade rate was 0.1%.
- » The average magnitude of rating downgrades hit 12.7 notches in February 2009, but declined to 9.1 notches at the end of 2009. The average size of rating upgrades was 3.4 notches.
- » The Aaa downgrade rate rose to 63% in 2009 from 26% last year, while the fallen angel rate climbed from 20% to 50%.
- » Rating stability rates exhibited a somewhat U-shaped pattern by original rating with the Aaa and single-B categories experiencing the lowest cumulative downgrade rate and single-A and Baa ratings the highest.

Figure 19: US RMBS Rating Transition Trends

FIGURE 19A

12-Month Upgrade and Downgrade Rates

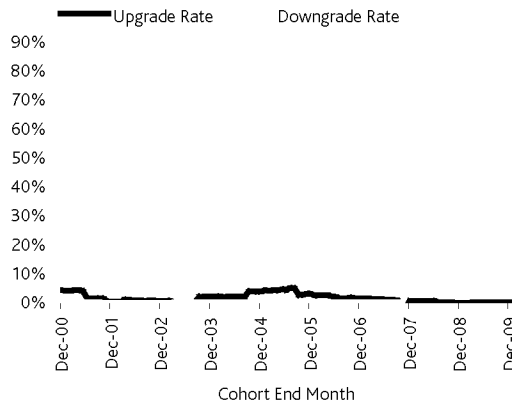


FIGURE 19B

Average Notches Upgraded and Downgraded

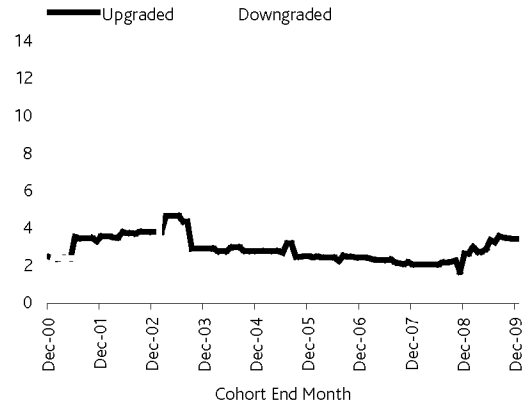


FIGURE 19C

Fallen Angel Rate and Aaa Downgrade Rate

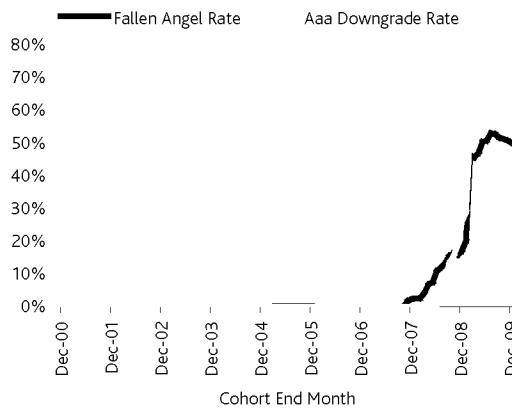


FIGURE 19D

Cumulative Upgrade and Downgrade Rates

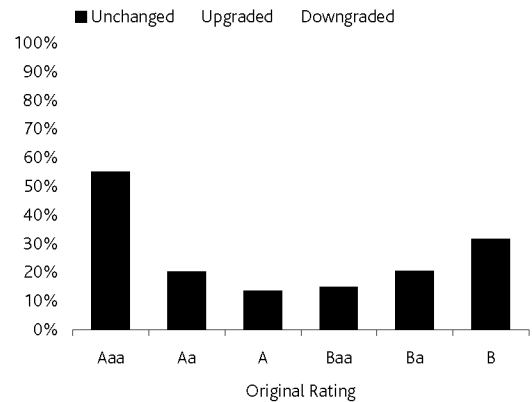


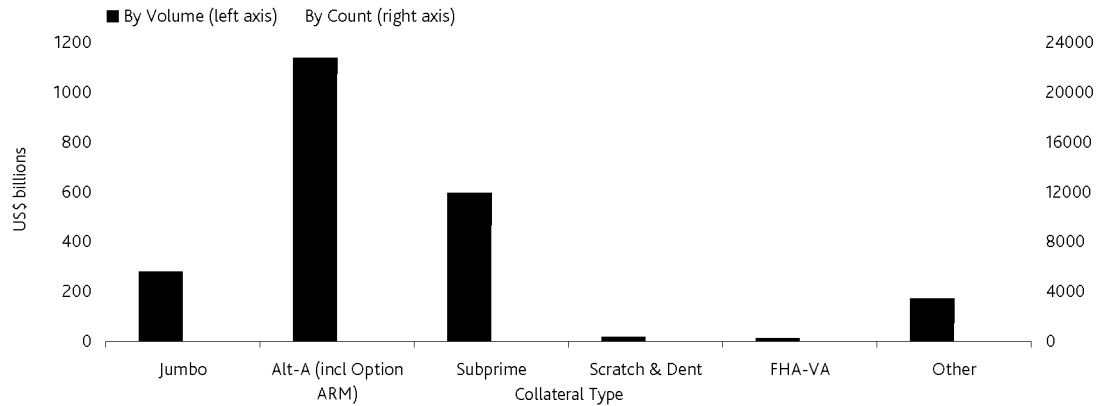
Figure 19E: Summary of Rating Transition Trends

|  | 2009     | 2008     | 2000-2009 | 2000-2008 |
|--|----------|----------|-----------|-----------|
| Downgrade Rate                           | 74.66%   | 37.23%   | 19.73%    | 5.34%     |
| Upgrade Rate                             | 0.09%    | 0.02%    | 1.12%     | 1.43%     |
| Downgrade/Upgrade Ratio                  | 795.42   | 2395.00  | 17.57     | 3.73      |
| Downgrade Rate (Notch Weighted)          | 675.86%  | 287.44%  | 199.07%   | 42.60%    |
| Upgrade Rate (Notch Weighted)            | 0.32%    | 0.04%    | 2.99%     | 3.79%     |
| Downgrade/Upgrade Ratio (Notch Weighted) | 2090.48  | 6935.06  | 66.60     | 11.23     |
| Rating Drift (Notch Weighted)            | -675.54% | -287.40% | -196.08%  | -38.81%   |
| Rating Volatility (Notch Weighted)       | 676.19%  | 287.48%  | 202.06%   | 46.40%    |
| Stability Rate                           | 25.25%   | 62.76%   | 79.15%    | 93.23%    |
| Average Number of Notches Downgraded     | 9.05     | 7.72     | 10.09     | 7.97      |
| Average Number of Notches Upgraded       | 3.44     | 2.67     | 2.66      | 2.65      |

Combining US HEL and RMBS downgrades in 2009, we see that over half of the negative rating changes involved securities backed by Alt-A mortgages (Figure 20). Tranches backed by first-lien subprime mortgage pools accounted for roughly a quarter of downgrades and those backed by jumbo mortgages made up 15% by count and 13% by volume.

FIGURE 20

## US HEL and RMBS Downgrades in 2009 by Collateral Type



Note: Option ARM mortgages are included in the classification of Alt-A. Resecuritizations are classified as "Other" regardless of the underlying collateral type of the securities backing the transaction.

Figure 21 shows the cumulative rating transition matrices by original rating for the major US HEL and RMBS loan types in the 2005-2007 vintages as of December 31, 2009. Initially rated Aaa securities backed by first-lien subprime mortgages have been the most stable among the four loan types while jumbo Aaa-rated securities have been the least stable. However, jumbo Aaa ratings have had a much lower migration rate to Caa and below compared to securities backed by Alt-A mortgages and subprime second-lien loans. Securities which initially carried ratings of Baa or lower have transitioned to Caa-C at rates in excess of 96% for all loan types except jumbo mortgages, where the rate is still high.

It is important to note that a large number of US HEL and RMBS securities from the 2005-2007 vintages were placed on review for downgrade in December 2009 and January 2010 after a revision of Moody's loss assumptions for deals from these vintages.<sup>7</sup> Therefore, these transition matrices are subject to further change depending on the amount of rating activity that occurs after the updated loss assumptions are incorporated.

<sup>7</sup> See Moody's Announcements, "[Moody's updates loss projections for US Prime Jumbo RMBS issued in 2005-2008](#)," December 17, 2009, "[Moody's updates loss projections for US Subprime RMBS issued in 2005-2007](#)," January 13, 2010, "[Moody's updates loss projections for US Alt-A RMBS issued in 2005-2007](#)," January 14, 2010, "[Moody's updates loss projections for US Option Arm RMBS issued in 2005-2007](#)," January 27, 2010.

**Figure 21: US HEL and RMBS Cumulative Rating Transitions by Original Rating for Select Loan Types within the 2005-2007 Vintages (as of 12/31/09)**

| Subprime Firsts         | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C   |
|-------------------------|--------|--------|--------|--------|--------|--------|---------|
| Aaa                     | 45.58% | 6.02%  | 5.47%  | 4.70%  | 8.09%  | 10.99% | 19.16%  |
| Aa                      |        | 10.27% | 8.19%  | 5.34%  | 7.11%  | 7.11%  | 61.99%  |
| A                       |        |        | 1.58%  | 3.80%  | 5.08%  | 5.68%  | 83.85%  |
| Baa                     |        |        |        | 0.90%  | 1.20%  | 1.57%  | 96.34%  |
| Ba                      |        |        |        |        | 1.09%  | 0.65%  | 98.26%  |
| Subprime Seconds        | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C   |
| Aaa                     | 24.79% | 4.23%  | 0.56%  | 4.51%  | 5.35%  | 9.01%  | 51.55%  |
| Aa                      | 2.16%  | 6.17%  | 0.31%  | 2.47%  | 1.54%  | 4.01%  | 83.33%  |
| A                       | 0.28%  | 0.28%  | 0.56%  | 0.56%  | 1.13%  | 1.41%  | 95.76%  |
| Baa                     |        |        |        | 0.24%  |        | 0.24%  | 99.51%  |
| Ba                      |        |        |        |        |        |        | 100.00% |
| Alt-A (incl Option ARM) | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C   |
| Aaa                     | 9.30%  | 3.19%  | 2.53%  | 8.14%  | 9.31%  | 15.24% | 52.30%  |
| Aa                      |        | 1.45%  | 0.28%  | 2.06%  | 5.20%  | 2.83%  | 88.19%  |
| A                       |        |        | 1.03%  | 0.74%  | 1.28%  | 1.18%  | 95.78%  |
| Baa                     |        |        |        | 0.97%  | 0.77%  | 0.41%  | 97.85%  |
| Ba                      |        |        |        |        | 0.88%  |        | 99.12%  |
| B                       |        |        |        |        |        | 3.64%  | 96.36%  |
| Jumbo                   | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C   |
| Aaa                     | 8.29%  | 5.92%  | 13.19% | 17.27% | 15.84% | 32.01% | 7.48%   |
| Aa                      |        | 2.92%  | 9.31%  | 12.04% | 12.41% | 13.32% | 50.00%  |
| A                       |        |        | 1.45%  | 4.35%  | 8.70%  | 14.49% | 71.01%  |
| Baa                     |        |        |        |        | 2.86%  | 11.43% | 85.71%  |
| Ba                      |        |        |        |        |        |        | 100.00% |
| B                       |        |        |        |        |        |        | 100.00% |

Note: The first column indicates the initial rating and the column indicates the rating as of 12/31/09 or rating prior to withdrawal.

## US CMBS

While US CMBS was one of the most stable structured finance sectors in 2008, particularly in comparison to US RMBS, downgrade activity for the sector increased in 2009 as commercial property prices fell sharply.<sup>8</sup> In total for 2009, US CMBS experienced 3,748 downgrades from 410 deals and 84 upgrades from 35 deals. Moody's completed ratings sweeps for CMBS conduit/fusion, large loan, and single borrower deals during the first quarter of 2009 and completed its ratings sweep of CRE CDOs in April 2009.<sup>9</sup> The sweep approach was needed to bring the ratings into alignment with Moody's current 2009-2010 outlook for commercial real estate collateral performance. For CRE CDOs, the sweep approach was also necessary to update key parameter assumptions used in the ratings

<sup>8</sup> See "Moody's/REAL Commercial Property Price Indices, January 2010," Moody's Special Report, January 2010.

<sup>9</sup> See "U.S. CMBS and CRE CDO Q1 2009: Surveillance Review," Moody's Special Report, May 13, 2009.

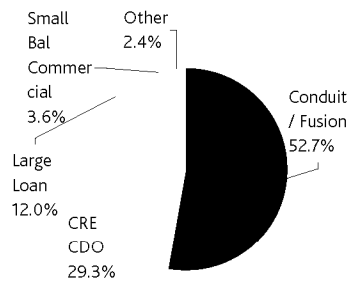


process. Although the bulk of the downgrades in 2009 occurred in the first four months of the year, rating actions continued throughout the year as part of Moody's ongoing surveillance effort.

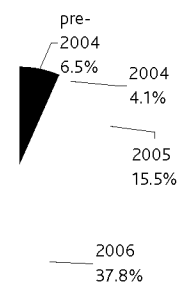
FIGURE 22

## Distribution of US CMBS Downgrades in 2009

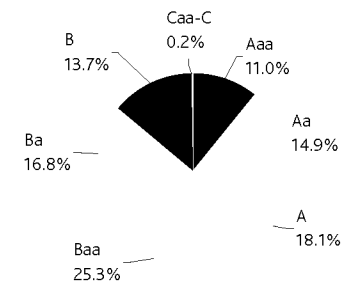
22A: By Deal Type



22B: By Vintage



22C: By Original Rating



Total Number of Downgrades: 3,748

Reflecting its status as the largest sub-sector of US CMBS, conduit/fusion deals accounted for the majority of the downgrades (53%) in 2009 (Figure 22A). CRE CDOs claimed the second largest share of downgrades (29%), but experienced a higher downgrade rate than conduit/fusion transactions – over 80% of the outstanding universe of CRE CDO securities had been downgraded by the end of 2009. Downgrades were concentrated in the 2006 and later vintages (74%), which is unsurprising given that this period coincided with the peak in commercial property prices (Figure 22B). Every rating category, including Aaa, experienced downgrades in 2009 with Baa ratings accounting for the largest share of negative transitions (Figure 22C).

Conduit/fusion transactions were also the largest contributor of upgrades (83%). Upgrades mostly affected securities that were originally rated investment-grade (74%) and reasons for upgrades included property performance improvement, defeasance, and changes in pool credit enhancement.

For the US CMBS sector in 2009 (see Figure 23):

- » The downgrade rate rose to 40% from 4.3% in 2008 while the upgrade dropped from 4.7% to 0.9%.
- » The average magnitude of downgrades increased 3 notches to 5.3 from 2.3 the year prior. The average size of upgrades increased also from 1.8 notches to 2.2 notches.
- » Like the overall downgrade rate, the fallen angel rate and Aaa downgrade rate increased sharply in 2009 and by the end of the year were 19% and 12%, respectively.
- » Despite the turmoil of the last year, Aaa-rated US CMBS remained the most stable of all the major sectors, maintaining a stability rate of roughly 90% to date. US CMBS that were originally rated Aa still have higher cumulative upgrade rates than downgrade rates and the single-A rating category experienced roughly similar lifetime positive and negative transition rates. For all other rating categories, downgrades have exceeded upgrades.

Figure 23: US CMBS Rating Transition Trends

FIGURE 23A

12-Month Upgrade and Downgrade Rates

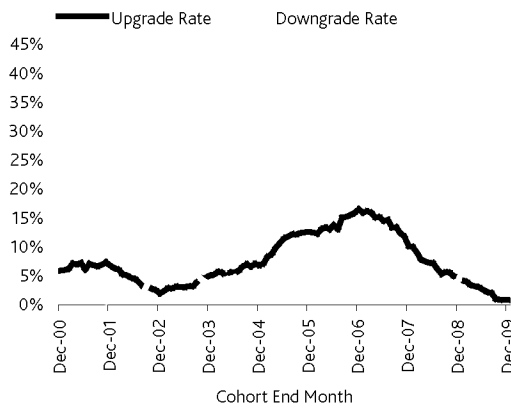


FIGURE 23B

Average Notches Upgraded and Downgraded

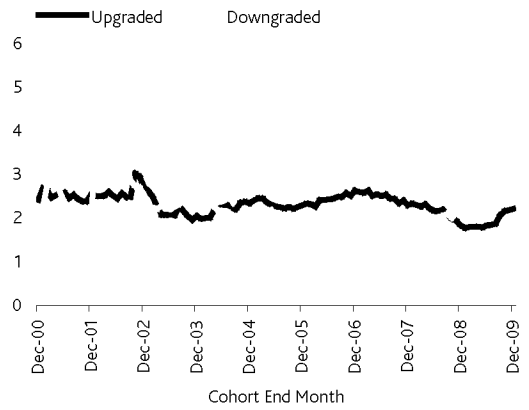


FIGURE 23C

Fallen Angel Rate and Aaa Downgrade Rate

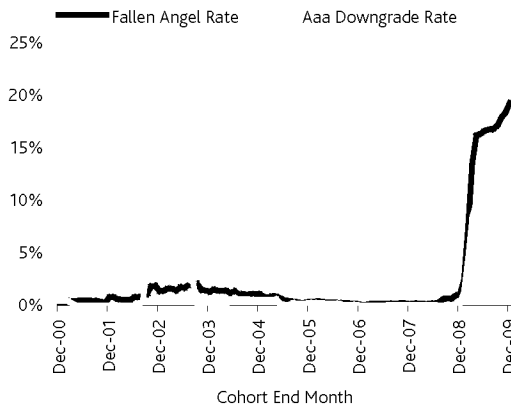


FIGURE 23D

Cumulative Upgrade and Downgrade Rates

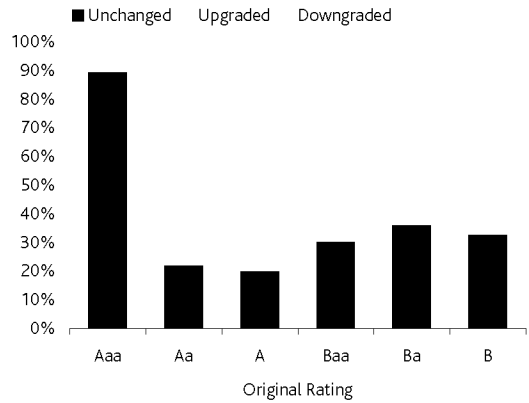


Figure 23E: Summary of Rating Transition Trends

|  | 2009     | 2008   | 2000-2009 | 2000-2008 |
|--|----------|--------|-----------|-----------|
| Downgrade Rate                           | 39.87%   | 4.29%  | 8.53%     | 2.63%     |
| Upgrade Rate                             | 0.89%    | 4.69%  | 7.90%     | 9.29%     |
| Downgrade/Upgrade Ratio                  | 44.61    | 0.91   | 1.08      | 0.28      |
| Downgrade Rate (Notch Weighted)          | 212.79%  | 9.78%  | 36.46%    | 5.69%     |
| Upgrade Rate (Notch Weighted)            | 1.98%    | 8.62%  | 18.51%    | 22.06%    |
| Downgrade/Upgrade Ratio (Notch Weighted) | 107.51   | 1.13   | 1.97      | 0.26      |
| Rating Drift (Notch Weighted)            | -210.81% | -1.15% | -17.95%   | 16.37%    |
| Rating Volatility (Notch Weighted)       | 214.77%  | 18.40% | 54.97%    | 27.75%    |
| Stability Rate                           | 59.23%   | 91.03% | 83.58%    | 88.09%    |
| Average Number of Notches Downgraded     | 5.34     | 2.28   | 4.28      | 2.17      |
| Average Number of Notches Upgraded       | 2.21     | 1.84   | 2.34      | 2.38      |

## US CDOs

US CDOs continued to experience high levels of downgrade activity in 2009. Overall, 7,069 securities from 1,878 transactions were downgraded and 68 securities from 25 transactions were upgraded. However, unlike the prior year when over 95% of CDO downgrades occurred among SF CDOs, downgrades in 2009 were spread over a number of deal types.

FIGURE 24A

### Number of US CDO Downgrades in 2009

By Deal Type

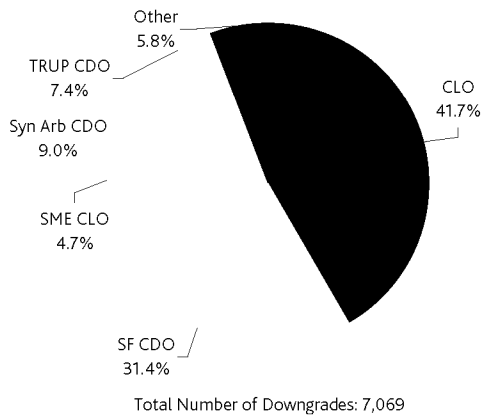
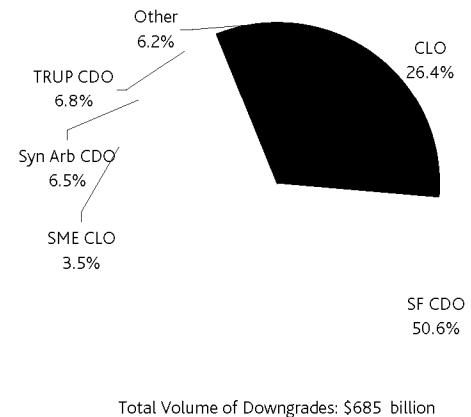


FIGURE 24B

### Volume of US CDO Downgrades in 2009

By Deal Type



CLOs accounted for the largest share of downgraded securities (42%) while SF CDOs claimed the largest percentage of downgrade volume (51%) (Figures 24A and 24B). The difference most likely resulted from the fact that there were more downgrades of senior tranches among SF CDOs, which tend to be of larger size than junior tranches. Synthetic Arbitrage CDOs, TRUP CDOs, and SME CLOs made up the rest of the top five in terms of downgrade activity.

Moody's conducted rating sweeps for a number of CDO deal types in late 2008 and 2009. In late 2008, Moody's initiated a review of all outstanding ratings on TRUP CDOs and also implemented new modeling assumptions with respect to key parameters such as asset correlations, default probability stresses and recovery rates for this sub-sector during the first quarter of 2009.<sup>10</sup> The ratings sweep was completed in April 2009 and resulted in significant ratings migration within this asset class.

In March 2009, following Moody's revision of its key assumptions in rating CLOs, Moody's initiated a global cash flow CLO ratings surveillance sweep.<sup>11</sup> The sweep occurred in two stages and included SME CLOs.<sup>12</sup> Downgrades taken during the surveillance sweep were largely the result of realized credit deterioration in the underlying portfolios and Moody's revised modeling assumptions, which together reflected the unprecedented credit stress that the corporate sector has been experiencing.

During the second quarter of 2009, Moody's completed a comprehensive ratings review for all SF CDOs globally. The review was in response to rapid deterioration in the performance of the underlying securities held by SF CDOs and revisions to modeling assumptions that Moody's

<sup>10</sup> See "US TRUP CDOs Surveillance: 2009 Year-End Update," Moody's Special Report, January 15, 2010.

<sup>11</sup> See "CLO Ratings Surveillance Brief – Third Quarter 2009," Moody's Special Report, October 30, 2009.

<sup>12</sup> See "Annual Sector Review: U.S. Small and Medium Enterprise CLOs," Moody's Special Report, January 27, 2010.

implemented with respect to key parameters related to asset correlation, default probability and recovery rate.<sup>13</sup> The rating review was also a result of Moody's revised loss projections on recent-vintage US Subprime, Alt-A and Option ARM securities, and anticipated and/or realized CMBS and CLO rating actions. In addition to these comprehensive rating sweeps, downgrades were taken for securities in these sub-sectors and for other CDOs on a deal-by-deal basis throughout the year.

Market value CDOs accounted for a quarter of all upgrades followed by SME CLOs (18%). SF CDOs, CLOs, and synthetic arbitrage CDOs each claimed a 15% share of upgrade activity. The reasons behind the upgrades were generally unrelated to the performance of the underlying assets and included delevering of the transaction, structural changes, and replacement of the collateral.

FIGURE 25A

## US CDO Downgrades in 2009 by Vintage

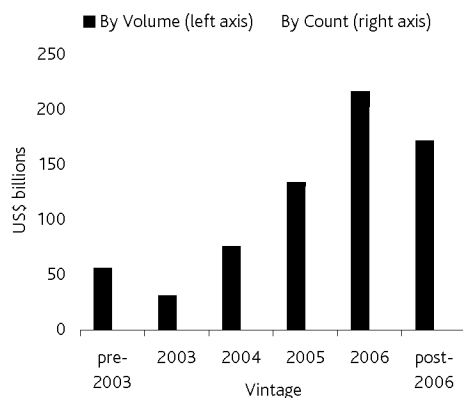


FIGURE 25B

## US CDO Downgrades in 2009 by Original Rating

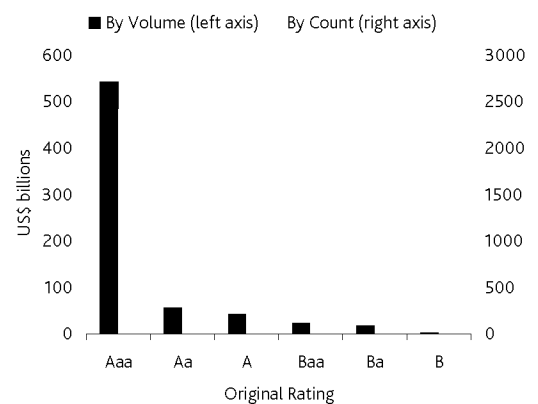


Figure 25 shows the distribution of downgrades in 2009 by vintage and original rating. By vintage, securities that were issued after 2005 made up 76% of downgrades by volume and 72% by count. The percentage of downgrades were monotonically decreasing by original rating category by both tranche count and volume, reflecting the average rating distribution of the classes in a deal and the relative size of the tranches within a typical transaction.

For the US CDO sector in 2009 (see Figure 26):

- » The 12-month downgrade rate reached a high of 69% in October 2009 and was 67% for the 2009 cohort. This was a 19-percentage point increase from the rate of 48% last year. The upgrade rate was flat at 0.6%.
- » The average severity of downgrades was reduced by 45% from 9.9 notches in 2008 to 5.4 notches in 2009. The average magnitude of upgrades was virtually unchanged at 2.6 notches.
- » The fallen angel rate increased to 44% from 34% last year and the Aaa downgrade rate rose to 58% from 47%.
- » Cumulative downgrade rates were high for all rating categories. Securities that were originally rated Aaa and single-B have experienced lifetime downgrade rates to date of approximately 67% and the frequency rose to roughly 80% for all other rating categories.

<sup>13</sup> See "Structured Finance CDO Ratings Surveillance Brief – Second Quarter 2009," Moody's Special Report, July 28, 2009.

Figure 26: US CDO Rating Transition Trends

FIGURE 26A

12-Month Upgrade and Downgrade Rates

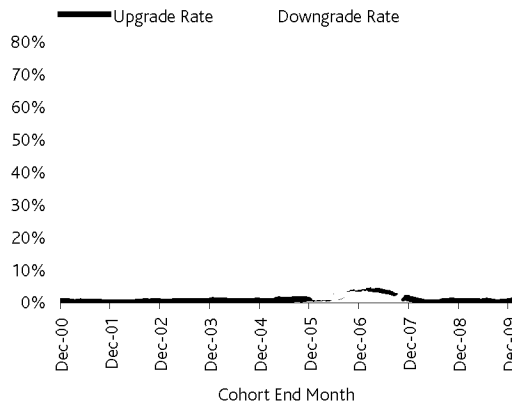


FIGURE 26B

Average Notches Upgraded and Downgraded

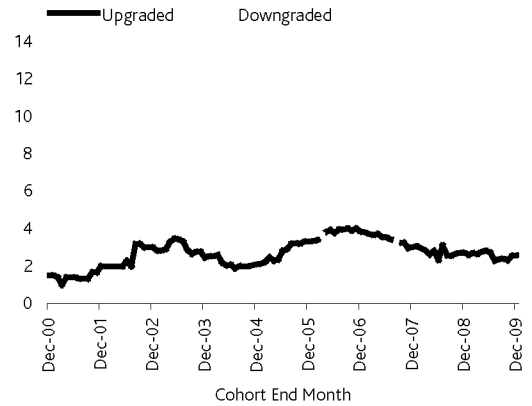


FIGURE 26C

Fallen Angel Rate and Aaa Downgrade Rate

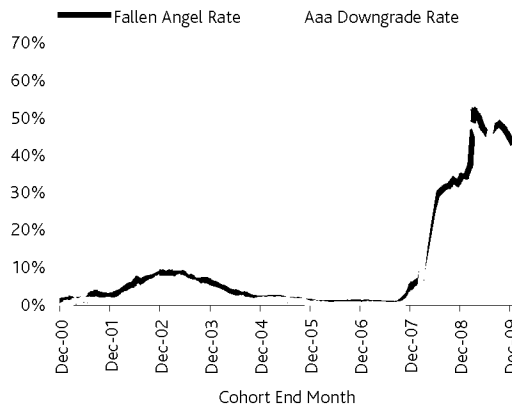


FIGURE 26D

Cumulative Upgrade and Downgrade Rates

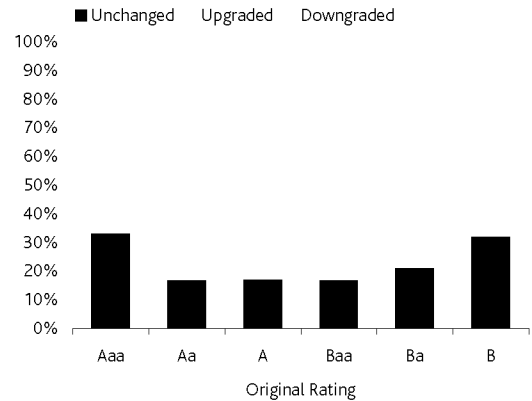
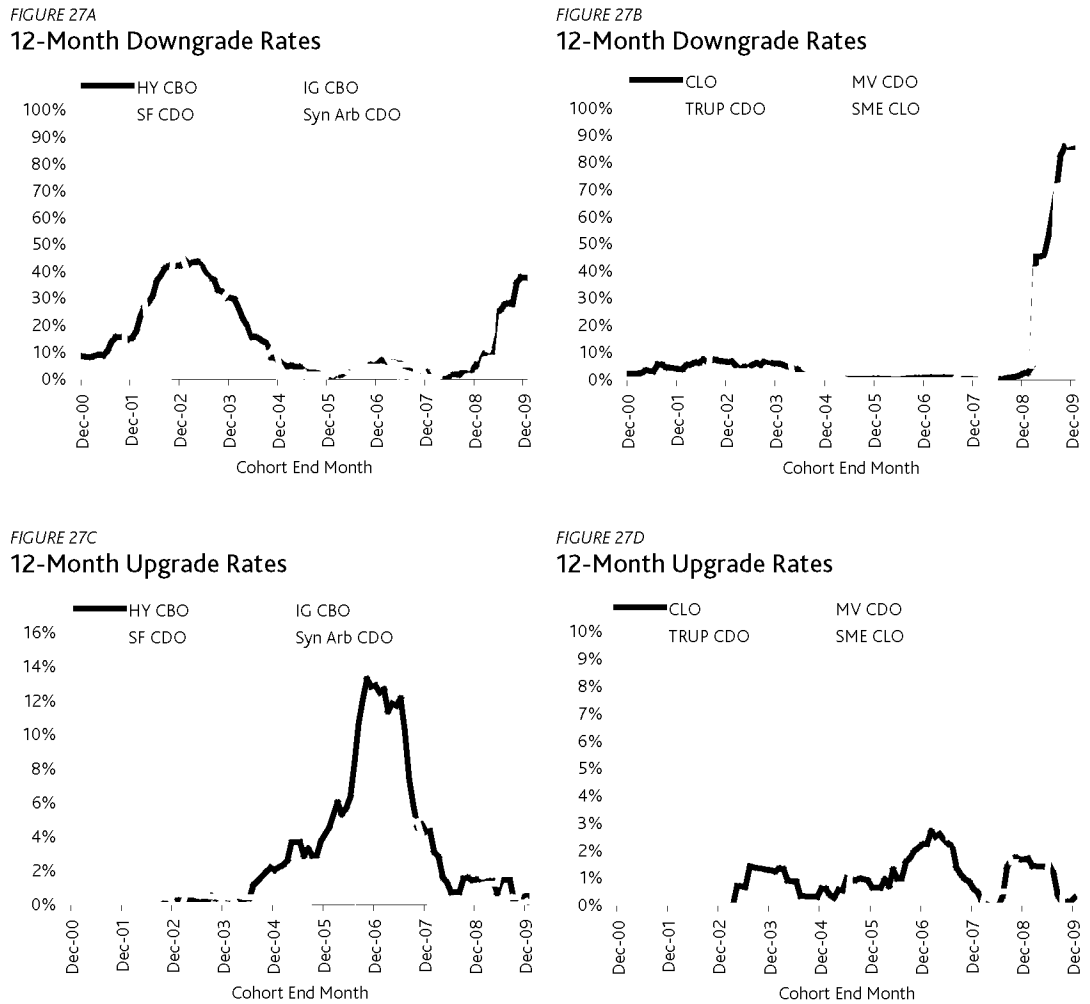


Figure 26E: Summary of Rating Transition Trends

|  | 2009     | 2008     | 2000-2009 | 2000-2008 |
|--|----------|----------|-----------|-----------|
| Downgrade Rate                           | 66.76%   | 48.12%   | 25.36%    | 13.98%    |
| Upgrade Rate                             | 0.64%    | 0.63%    | 1.09%     | 1.26%     |
| Downgrade/Upgrade Ratio                  | 103.93   | 76.99    | 23.33     | 11.12     |
| Downgrade Rate (Notch Weighted)          | 362.50%  | 477.68%  | 200.40%   | 119.61%   |
| Upgrade Rate (Notch Weighted)            | 1.65%    | 1.69%    | 3.52%     | 4.18%     |
| Downgrade/Upgrade Ratio (Notch Weighted) | 219.26   | 281.98   | 56.89     | 28.60     |
| Rating Drift (Notch Weighted)            | -360.85% | -475.99% | -196.87%  | -115.43%  |
| Rating Volatility (Notch Weighted)       | 364.16%  | 479.37%  | 203.92%   | 123.79%   |
| Stability Rate                           | 32.59%   | 51.25%   | 73.55%    | 84.76%    |
| Average Number of Notches Downgraded     | 5.43     | 9.93     | 7.90      | 8.55      |
| Average Number of Notches Upgraded       | 2.57     | 2.71     | 3.24      | 3.33      |

Twelve-month downgrade rates rose for most major CDO deal types in 2009 except for SF CDOs where the frequency of downgrades peaked in 2008 (Figures 27A and 27B). Aside from market value CDOs, SME CLOs, and investment-grade CBOs, all other deal types experienced low levels of upgrade activity in 2009 (Figures 27C and 27D).

Figure 27: 12-month Downgrade and Upgrade Rates for Select CDO Deal Types



Figures 28 and 29 contrast the cumulative rating migration experience of the two largest CDO sub-sectors, SF CDOs and CLOs. Both sectors have experienced high downgrade rates, but the severity of the downgrades has been much lower for CLOs than they have been for SF CDOs. Roughly 80%-90% of SF CDO securities originally rated Ba or above were rated Caa or below as of the end of 2009. In comparison, 99% of CLO classes that were originally rated Aaa and 96% of tranches initially rated Aa were still rated investment-grade as of the end of the year. In addition, CLOs had much lower percentages of ratings downgraded to Caa-C than did SF CDOs.

**Figure 28: US SF CDO Cumulative Rating Transitions by Original Rating as of 12/31/09**

| Original Rating | Current Rating/Last Rating before WR |       |       |       |        |        |        |
|-----------------|--------------------------------------|-------|-------|-------|--------|--------|--------|
|                 | Aaa                                  | Aa    | A     | Baa   | Ba     | B      | Caa-C  |
| Aaa             | 9.56%                                | 1.44% | 2.21% | 1.13% | 3.96%  | 4.22%  | 77.48% |
| Aa              | 0.33%                                | 6.67% | 0.67% | 0.89% | 1.22%  | 1.56%  | 88.67% |
| A               |                                      | 0.62% | 9.58% | 2.36% | 1.12%  | 0.50%  | 85.82% |
| Baa             |                                      | 0.11% | 0.22% | 5.14% | 0.55%  | 0.66%  | 93.33% |
| Ba              |                                      |       | 0.36% | 0.36% | 5.38%  | 1.79%  | 92.11% |
| B               |                                      |       |       |       | 16.67% | 16.67% | 66.67% |

**Figure 29: US CLO Cumulative Rating Transitions by Original Rating as of 12/31/09**

| Original Rating | Current Rating/Last Rating before WR |        |        |        |        |        |        |
|-----------------|--------------------------------------|--------|--------|--------|--------|--------|--------|
|                 | Aaa                                  | Aa     | A      | Baa    | Ba     | B      | Caa-C  |
| Aaa             | 45.26%                               | 40.86% | 12.18% | 0.59%  | 0.51%  | 0.25%  | 0.34%  |
| Aa              | 3.90%                                | 23.84% | 45.13% | 22.94% | 3.30%  | 0.15%  | 0.75%  |
| A               | 1.65%                                | 0.96%  | 14.72% | 28.89% | 46.91% | 4.68%  | 2.20%  |
| Baa             | 0.56%                                | 0.78%  | 1.34%  | 17.43% | 18.21% | 34.75% | 26.93% |
| Ba              | 0.18%                                |        |        | 0.71%  | 18.62% | 12.23% | 68.26% |
| B               |                                      |        |        |        |        | 28.57% | 71.43% |

## Other Structured Finance

The other structured finance category contains a diverse group of asset types outside of the four major sectors (ABS, RMBS, CMBS, and CDOs), including covered bonds, asset-backed commercial paper (ABCP), derivative product companies (DPCs), insurance-linked securities such as catastrophe bonds, and structured investment vehicles (SIVs). The overall downgrade rate for the sector rose from 16% in 2008 to 19% in 2009 while the upgrade rate increased from 1.3% to 2.1%.

In summary for 2009:

- » Covered Bonds:<sup>14</sup> Globally, covered bonds experienced 51 downgrades and 3 upgrades. Nineteen of the downgrades involved Spanish multi-issuer covered bonds (SMICBs) and were downgraded primarily due to the downgrade of many of the unsecured long-term debt ratings of the issuers of the Spanish covered bonds (Cedulas) backing the SMICBs. Most of the other covered bond downgrades were also caused by downgrades of the issuer.
- » ABCP: There were 5 downgrades of long-term ratings for the ABCP sector in 2009. The downgrades involved two transactions: Ocala Funding<sup>15</sup> and Curzon Funding.

<sup>14</sup> Note that we include Spanish multi-issuer covered bonds and Irish mortgage-backed promissory notes in the analysis of covered bonds. In addition, the Other Structured Finance category is defined globally so the discussion also includes covered bond programs rated outside of EMEA.

<sup>15</sup> See Moody's Announcements, "Moody's downgrades Ocala Funding's ABCP and Subordinated Notes," August 19, 2009 and "Moody's Downgrades Ocala Funding's Subordinated RMBS Notes," August 21, 2009.

- » DPCs: The senior debt programs and counterparty rating of Theta Corporation were downgraded in March 2009.
- » Insurance Linked Notes: Five classes of two catastrophe bond programs were upgraded in 2009. The upgrades were due in large part to the fact that no qualified events that can trigger losses to the transactions had occurred in the first one or two years of the risk period covered.
- » SIVs: Seventeen notes from 12 SIVs were downgraded in 2009. In nine of the cases, the downgrade was to Ca or C.

## Regional Comparisons of Rating Transitions

### EMEA and US Rating Transitions

The continuing global economic slump also resulted in elevated downgrade activity for EMEA structured finance in 2009. All told, 3,646 ratings from 1,055 deals were downgraded and 93 ratings from 51 deals were upgraded during the year. CDOs accounted for the largest percentage of downgrades (70%), followed by RMBS (13%), ABS (8%), and CMBS (7%). Upgrades in 2009 were concentrated in ABS (41%), CDOs (29%), and RMBS (20%).

The same factors that drove US CDO downgrades in 2009 were behind the CDO downgrades in EMEA. Most RMBS downgrades involved mortgage pools that were originated in the UK or Spain. Spanish transactions backed by small business loans and consumer loans were a major contributor of ABS downgrades along with UK SME ABS. EMEA CMBS were adversely affected by the deteriorating commercial real estate lending, investment, and occupational markets in Europe. EMEA structured finance also experienced a scatter of downgrades among covered bonds, several SIVs, one derivative product company, and one ABCP program.

Approximately 70% of the EMEA ABS upgrades involved Turkish Diversified Payment Rights (DPR) or Credit Card Voucher (CCV) transactions and were due to an alignment of the rating of the notes to the global local currency deposit rating of the originators. Similar to US CDOs, most EMEA CDO upgrades were unrelated to the performance of the collateral. Reasons for RMBS upgrades were roughly split between a build-up of credit enhancement and better-than-expected performance of the underlying loans.

Both the 12-month downgrade rates and the average magnitudes of downgrades for EMEA and the US have been highly correlated (Figures 30A and 30B). However, since late 2007, the frequency of downgrades has increased more sharply in the US than EMEA resulting in a 59% downgrade rate in 2009 for the US versus 40% for EMEA. The average notches downgraded for EMEA has been almost universally lower than that of the US historically and this remained true in 2009. The average magnitude of downgrades in EMEA for 2009 was 5.3 notches or 2.2 notches lower than the 7.5 notch average for the US.

Upgrade activity for the two regions experienced comparable patterns over the last decade (Figure 30C). The frequency of upgrades for EMEA and the US has been declining since early 2008 and stood at 1.0% in 2009 for EMEA and 0.6% for the US. For most of the last 10 years, the average magnitude of upgrades has been lower in EMEA, but the two regions were roughly within half a notch of each other for all of 2009; the gap tightened to 0.1 notches for the cohort ending December 2009 (Figure 30D).



Figure 30: Rating Transition Trends for EMEA and US Structured Finance

FIGURE 30A

12-Month Downgrade Rates

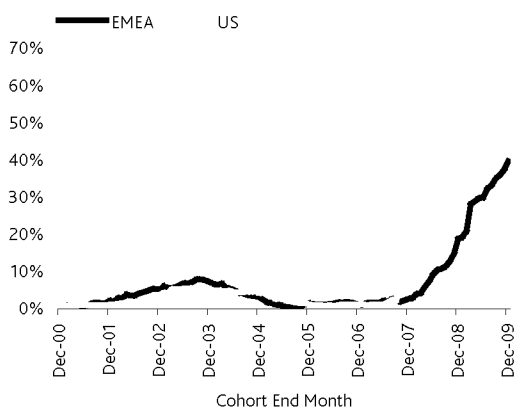


FIGURE 30B

Average Notches Downgraded

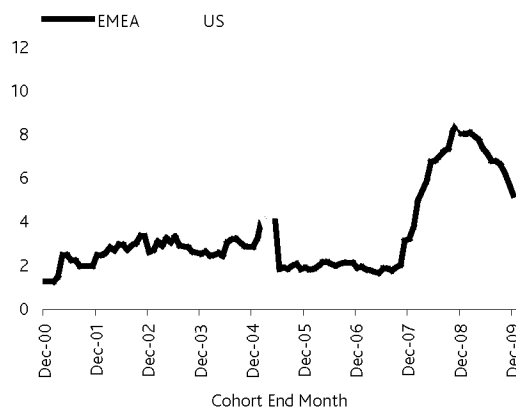


FIGURE 30C

12-Month Upgrade Rates

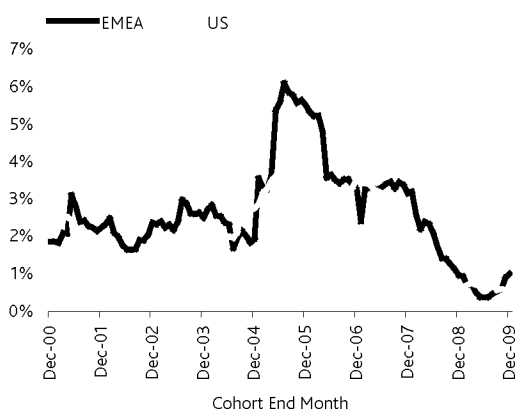


FIGURE 30D

Average Notches Upgraded

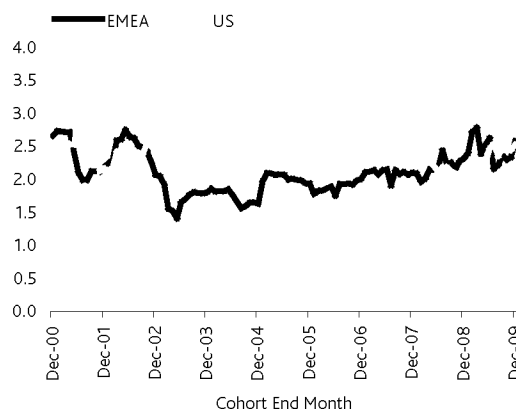


Figure 30E: Summary of Rating Transition Trends

|  | EMEA     |          |           | US       |          |           |
|--|----------|----------|-----------|----------|----------|-----------|
|  | 2009     | 2008     | 2000-2009 | 2009     | 2008     | 2000-2009 |
| Downgrade Rate                           | 39.69%   | 18.89%   | 10.43%    | 58.56%   | 38.05%   | 18.58%    |
| Upgrade Rate                             | 1.00%    | 0.96%    | 2.46%     | 0.59%    | 0.60%    | 1.85%     |
| Downgrade/Upgrade Ratio                  | 39.54    | 19.59    | 4.24      | 99.37    | 62.96    | 10.03     |
| Downgrade Rate (Notch Weighted)          | 208.45%  | 152.77%  | 65.98%    | 442.09%  | 317.36%  | 155.35%   |
| Upgrade Rate (Notch Weighted)            | 2.60%    | 2.24%    | 5.02%     | 1.49%    | 1.18%    | 4.63%     |
| Downgrade/Upgrade Ratio (Notch Weighted) | 80.27    | 68.10    | 13.15     | 296.33   | 268.30   | 33.53     |
| Rating Drift (Notch Weighted)            | -205.85% | -150.52% | -60.96%   | -440.60% | -316.17% | -150.71%  |
| Rating Volatility (Notch Weighted)       | 211.04%  | 155.01%  | 71.00%    | 443.58%  | 318.54%  | 159.98%   |
| Stability Rate                           | 59.30%   | 80.15%   | 87.12%    | 40.85%   | 61.34%   | 79.56%    |
| Average Number of Notches Downgraded     | 5.25     | 8.09     | 6.33      | 7.55     | 8.34     | 8.36      |
| Average Number of Notches Upgraded       | 2.59     | 2.33     | 2.04      | 2.53     | 1.96     | 2.50      |

Figure 31 compares the EMEA and US 12-month rating transition matrices for 2009. Ratings were more stable in EMEA than the US for all major rating categories. As noted above, when downgrades have occurred, they have been less severe, particularly for Aaa ratings. Moreover, EMEA structured finance experienced lower transitions to the Caa and below category across the capital structure, especially for higher ratings.

**Figure 31: EMEA and US Structured Finance 12-month Rating Transition Matrices for 2009**

| EMEA in 2009 | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  |
|--------------|--------|--------|--------|--------|--------|--------|--------|
| Aaa          | 76.93% | 15.71% | 3.84%  | 2.09%  | 0.60%  | 0.40%  | 0.43%  |
| Aa           | 0.93%  | 60.80% | 14.13% | 14.27% | 4.87%  | 2.60%  | 2.40%  |
| A            | 0.40%  | 0.61%  | 58.32% | 10.03% | 16.30% | 6.20%  | 8.15%  |
| Baa          | 0.07%  | 0.07%  | 0.86%  | 54.87% | 9.41%  | 15.64% | 19.09% |
| Ba           | 0.13%  |        |        | 0.54%  | 38.44% | 7.12%  | 53.76% |
| B            | 0.37%  |        |        | 0.37%  |        | 27.51% | 71.75% |
| Caa-C        |        |        |        | 0.62%  | 0.16%  | 0.16%  | 99.06% |
| US in 2009   | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  |
| Aaa          | 52.22% | 9.98%  | 7.67%  | 6.63%  | 5.62%  | 6.45%  | 11.43% |
| Aa           | 0.62%  | 32.34% | 15.58% | 13.08% | 10.03% | 9.79%  | 18.57% |
| A            | 0.57%  | 1.10%  | 27.24% | 15.45% | 14.74% | 13.63% | 27.26% |
| Baa          | 0.14%  | 0.25%  | 0.46%  | 27.61% | 13.21% | 19.51% | 38.81% |
| Ba           | 0.02%  | 0.02%  | 0.09%  | 1.21%  | 20.26% | 15.25% | 63.16% |
| B            |        | 0.02%  | 0.02%  | 0.04%  | 0.16%  | 18.44% | 81.33% |
| Caa-C        |        |        |        |        | 0.01%  | 0.03%  | 99.96% |

### Asia Pacific and US Rating Transitions

The Asia-Pacific region also experienced heightened downgrade activity in 2009, but not to the degree experienced by the US structured finance market. During the year, 601 ratings from 284 deals were downgraded and 37 ratings from 21 deals were upgraded.

Approximately half of the downgrades came from the CMBS sector and 98% of those involved Japanese securities, most of which were downgraded after Moody's updated its key surveillance assumptions for the monitoring of Japanese CMBS ratings.<sup>16</sup> RMBS was the second largest contributor of downgrades at 24%. Sixty-eight percent of the RMBS downgrades involved securities backed by Australian mortgages and almost all of the classes were downgraded due to the downgrade of Genworth Financial Mortgage Insurance Pty Ltd.<sup>17</sup> An additional 21% affected Japanese RMBS that were also downgraded due to the downgrade of a related party. CDOs saw 113 downgrades (19%) and ABS experienced 41 downgrades (7%).

Of the 37 upgrades, 27 affected ABS, 5 affected CDOs, and 5 involved RMBS. The top reason for upgrades was strong collateral performance. Other reasons included a build-up of credit performance and the passage of time.

<sup>16</sup> See "Methodology Update: Surveillance Assumptions for Japanese CMBS," Moody's Rating Methodology report, April 14, 2009.

<sup>17</sup> See Moody's Announcement, "Moody's releases review outcome for Australian RMBS," February 24, 2009.

Both the Asia-Pacific and US structured finance downgrade rates increased over 2009, but the Asia-Pacific downgrade rate of 25% was less than half the rate for the US (Figure 32A). The difference between the average numbers of notches downgraded for the two regions was even wider with Asia-Pacific securities exhibiting an average of 2.9 versus 7.5 for the US (Figure 32B). The frequency of upgrades declined from 2.5% in 2008 to 1.5% in 2009, but remained higher in the Asia-Pacific than in the US as has been the case for most of the last 10 years (Figure 32C). The average size of upgrades also declined to 2.1 notches from 3.3 notches the previous year (Figure 32D).

Figure 32: Rating Transition Trends for Asia-Pacific and US Structured Finance

FIGURE 32A

12-Month Downgrade Rates

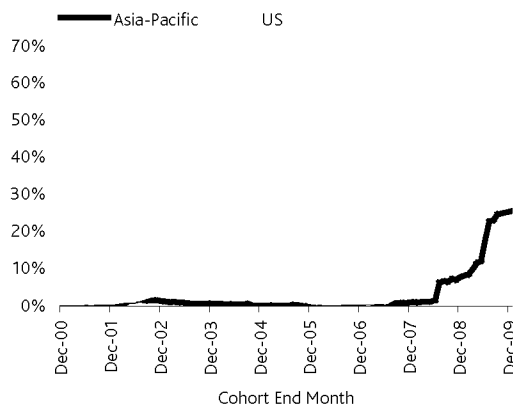


FIGURE 32B

Average Notches Downgraded

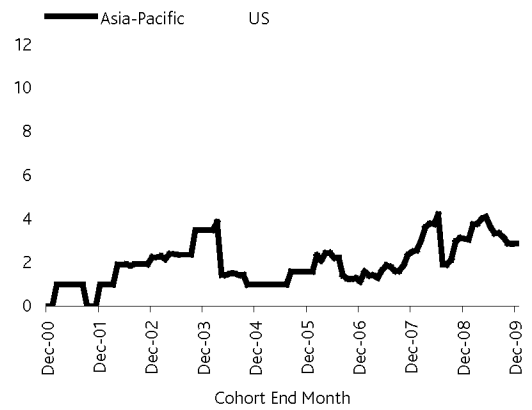


FIGURE 32C

12-Month Upgrade Rates

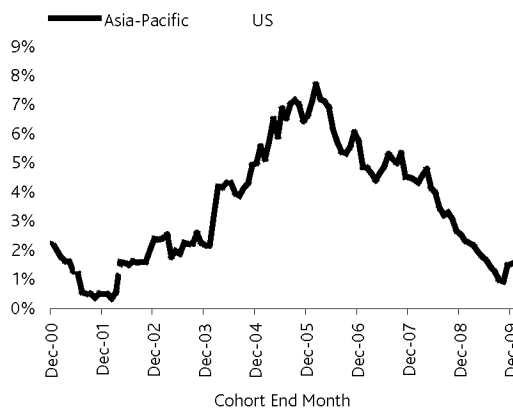
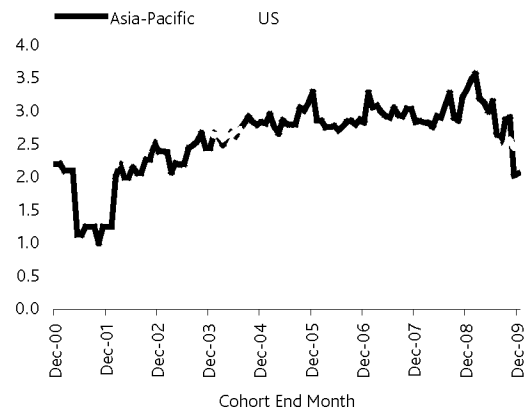


FIGURE 32D

Average Notches Upgraded



**Figure 32E: Summary of Rating Transition Trends**

|  | Asia-Pacific |         |           | US       |          |           |
|--|--------------|---------|-----------|----------|----------|-----------|
|  | 2009         | 2008    | 2000-2009 | 2009     | 2008     | 2000-2009 |
| Downgrade Rate                           | 25.42%       | 7.71%   | 4.07%     | 58.56%   | 38.05%   | 18.58%    |
| Upgrade Rate                             | 1.55%        | 2.54%   | 3.79%     | 0.59%    | 0.60%    | 1.85%     |
| Downgrade/Upgrade Ratio                  | 16.44        | 3.03    | 1.07      | 99.37    | 62.96    | 10.03     |
| Downgrade Rate (Notch Weighted)          | 73.04%       | 23.84%  | 12.46%    | 442.09%  | 317.36%  | 155.35%   |
| Upgrade Rate (Notch Weighted)            | 3.18%        | 8.47%   | 10.77%    | 1.49%    | 1.18%    | 4.63%     |
| Downgrade/Upgrade Ratio (Notch Weighted) | 22.99        | 2.82    | 1.16      | 296.33   | 268.30   | 33.53     |
| Rating Drift (Notch Weighted)            | -69.86%      | -15.37% | -1.68%    | -440.60% | -316.17% | -150.71%  |
| Rating Volatility (Notch Weighted)       | 76.21%       | 32.30%  | 23.23%    | 443.58%  | 318.54%  | 159.98%   |
| Stability Rate                           | 73.04%       | 89.75%  | 92.13%    | 40.85%   | 61.34%   | 79.56%    |
| Average Number of Notches Downgraded     | 2.87         | 3.09    | 3.06      | 7.55     | 8.34     | 8.36      |
| Average Number of Notches Upgraded       | 2.06         | 3.33    | 2.84      | 2.53     | 1.96     | 2.50      |

Across all rating categories, Asia-Pacific structured finance securities were more stable in 2009 than US structured finance securities and transitions to Caa and below were less frequent (Figure 33). This was especially true of Aaa-rated securities which had a stability rate of close to 90%.

**Figure 33: Asia-Pacific and US Structured Finance 12-month Rating Transition Matrices for 2009**

| Asia-Pacific in 2009 | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C   |
|----------------------|--------|--------|--------|--------|--------|--------|---------|
| Aaa                  | 89.62% | 9.04%  | 0.92%  | 0.17%  | 0.17%  |        | 0.08%   |
| Aa                   | 1.58%  | 67.79% | 28.83% | 1.35%  |        | 0.23%  | 0.23%   |
| A                    | 0.78%  | 2.33%  | 71.71% | 16.67% | 5.04%  | 1.16%  | 2.33%   |
| Baa                  |        | 0.84%  | 1.27%  | 57.81% | 24.47% | 10.55% | 5.06%   |
| Ba                   |        |        |        | 2.42%  | 43.55% | 40.32% | 13.71%  |
| B                    |        |        |        |        | 2.04%  | 38.78% | 59.18%  |
| Caa-C                |        |        |        |        |        |        | 100.00% |
| US in 2009           | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C   |
| Aaa                  | 52.22% | 9.98%  | 7.67%  | 6.63%  | 5.62%  | 6.45%  | 11.43%  |
| Aa                   | 0.62%  | 32.34% | 15.58% | 13.08% | 10.03% | 9.79%  | 18.57%  |
| A                    | 0.57%  | 1.10%  | 27.24% | 15.45% | 14.74% | 13.63% | 27.26%  |
| Baa                  | 0.14%  | 0.25%  | 0.46%  | 27.61% | 13.21% | 19.51% | 38.81%  |
| Ba                   | 0.02%  | 0.02%  | 0.09%  | 1.21%  | 20.26% | 15.25% | 63.16%  |
| B                    |        | 0.02%  | 0.02%  | 0.04%  | 0.16%  | 18.44% | 81.33%  |
| Caa-C                |        |        |        |        | 0.01%  | 0.03%  | 99.96%  |

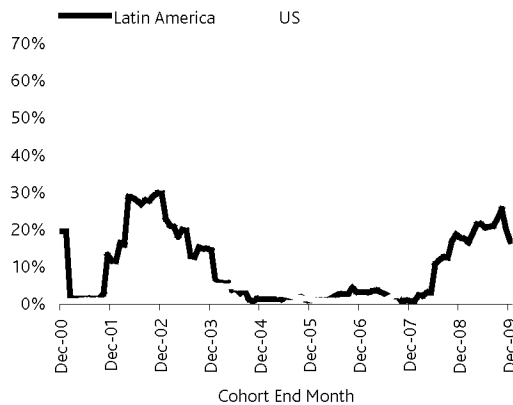
### Latin America and US Rating Transitions

Latin American structured finance securities experienced 50 downgrades from 43 deals and 2 upgrades from 2 deals in 2009. Sixty percent of the downgrades affected ABS and the remaining downgrades involved RMBS. The most prevalent reason for the negative rating actions was the downgrade of a third party, but 17 Mexican residential mortgage-backed securities were downgraded due to weak collateral performance. The two upgrades were attributable to the upgrades of a related entity.

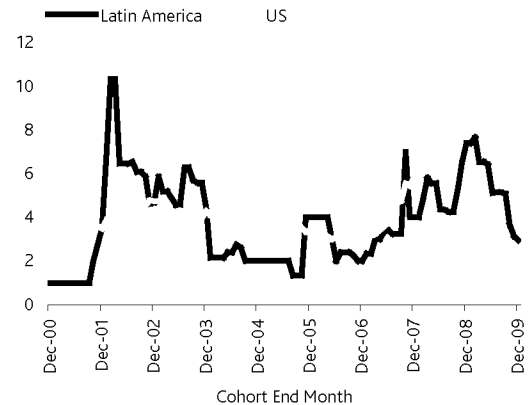
The Latin American 12-month downgrade rate reached its highest level in approximately 7 years in October 2009, but declined to 17% by December 2009 (Figure 34A). The average downgrade severity was 3.0 notches in 2009 or 4.4 notches lower than its year-prior level (Figure 34B). The upgrade rate declined from 3.1% to 0.7% and the average magnitude of upgrades fell slightly from 1.3 notches in 2008 to a single notch in 2009 (Figures 34C and 34D).

**Figure 34: Rating Transition Trends for Latin America and US Structured Finance**

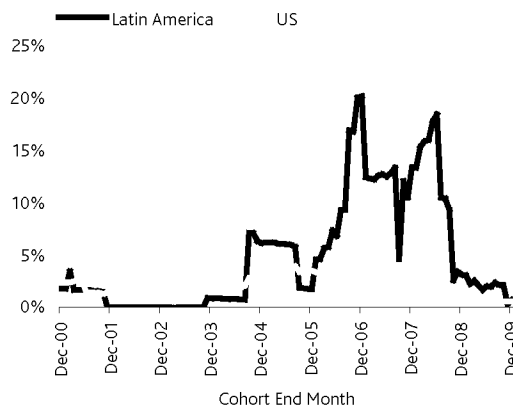
**FIGURE 34A**  
12-Month Downgrade Rates



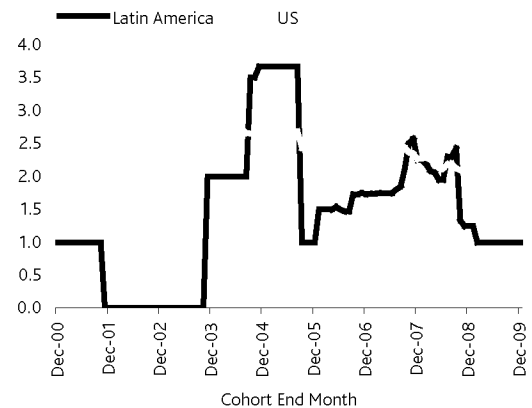
**FIGURE 34B**  
Average Notches Downgraded



**FIGURE 34C**  
12-Month Upgrade Rates



**FIGURE 34D**  
Average Notches Upgraded



**Figure 34E: Summary of Rating Transition Trends**

|  | Latin America |          |           | US       |          |           |
|--|---------------|----------|-----------|----------|----------|-----------|
|  | 2009          | 2008     | 2000-2009 | 2009     | 2008     | 2000-2009 |
| Downgrade Rate                           | 17.01%        | 17.97%   | 9.78%     | 58.56%   | 38.05%   | 18.58%    |
| Upgrade Rate                             | 0.69%         | 3.13%    | 5.95%     | 0.59%    | 0.60%    | 1.85%     |
| Downgrade/Upgrade Ratio                  | 24.50         | 5.75     | 1.64      | 99.37    | 62.96    | 10.03     |
| Downgrade Rate (Notch Weighted)          | 50.35%        | 132.81%  | 49.60%    | 442.09%  | 317.36%  | 155.35%   |
| Upgrade Rate (Notch Weighted)            | 0.69%         | 3.91%    | 12.00%    | 1.49%    | 1.18%    | 4.63%     |
| Downgrade/Upgrade Ratio (Notch Weighted) | 72.50         | 34.00    | 4.13      | 296.33   | 268.30   | 33.53     |
| Rating Drift (Notch Weighted)            | -49.65%       | -128.91% | -37.60%   | -440.60% | -316.17% | -150.71%  |
| Rating Volatility (Notch Weighted)       | 51.04%        | 136.72%  | 61.60%    | 443.58%  | 318.54%  | 159.98%   |
| Stability Rate                           | 82.29%        | 78.91%   | 84.27%    | 40.85%   | 61.34%   | 79.56%    |
| Average Number of Notches Downgraded     | 2.96          | 7.39     | 5.07      | 7.55     | 8.34     | 8.36      |
| Average Number of Notches Upgraded       | 1.00          | 1.25     | 2.02      | 2.53     | 1.96     | 2.50      |

Interestingly, there were no outstanding Aaa ratings for Latin America structured finance in 2009 (Figure 35). All Aaa ratings that were outstanding at the start of the previous year were wrapped and unable to maintain their original rating due to the downgrade of the guarantor. Downgrades that occurred for securities rated Aa, single-A, or single-B in the beginning of the 2009 were mild and kept the rating within the same broad category. Downgrades to securities in the Ba rating category were the most severe as a significant percentage dropped to Caa and below, but the transition rate to the lowest ratings was still smaller than that of the US.

**Figure 35: Latin America and US Structured Finance 12-month Rating Transition Matrices for 2009**

| Latin America in 2009 | Aaa    | Aa      | A       | Baa    | Ba     | B       | Caa-C  |
|-----------------------|--------|---------|---------|--------|--------|---------|--------|
| Aaa                   |        |         |         |        |        |         |        |
| Aa                    |        | 100.00% |         |        |        |         |        |
| A                     |        |         | 100.00% |        |        |         |        |
| Baa                   |        |         |         | 82.54% | 12.70% | 3.97%   | 0.79%  |
| Ba                    |        |         |         |        | 87.72% | 1.75%   | 10.53% |
| B                     |        |         |         |        |        | 100.00% |        |
| Caa-C                 |        |         |         |        |        | 2.38%   | 97.62% |
| US in 2009            | Aaa    | Aa      | A       | Baa    | Ba     | B       | Caa-C  |
| Aaa                   | 52.22% | 9.98%   | 7.67%   | 6.63%  | 5.62%  | 6.45%   | 11.43% |
| Aa                    | 0.62%  | 32.34%  | 15.58%  | 13.08% | 10.03% | 9.79%   | 18.57% |
| A                     | 0.57%  | 1.10%   | 27.24%  | 15.45% | 14.74% | 13.63%  | 27.26% |
| Baa                   | 0.14%  | 0.25%   | 0.46%   | 27.61% | 13.21% | 19.51%  | 38.81% |
| Ba                    | 0.02%  | 0.02%   | 0.09%   | 1.21%  | 20.26% | 15.25%  | 63.16% |
| B                     |        | 0.02%   | 0.02%   | 0.04%  | 0.16%  | 18.44%  | 81.33% |
| Caa-C                 |        |         |         |        | 0.01%  | 0.03%   | 99.96% |

## Rating Transitions Among Global Repackaged Securities and Structured Notes

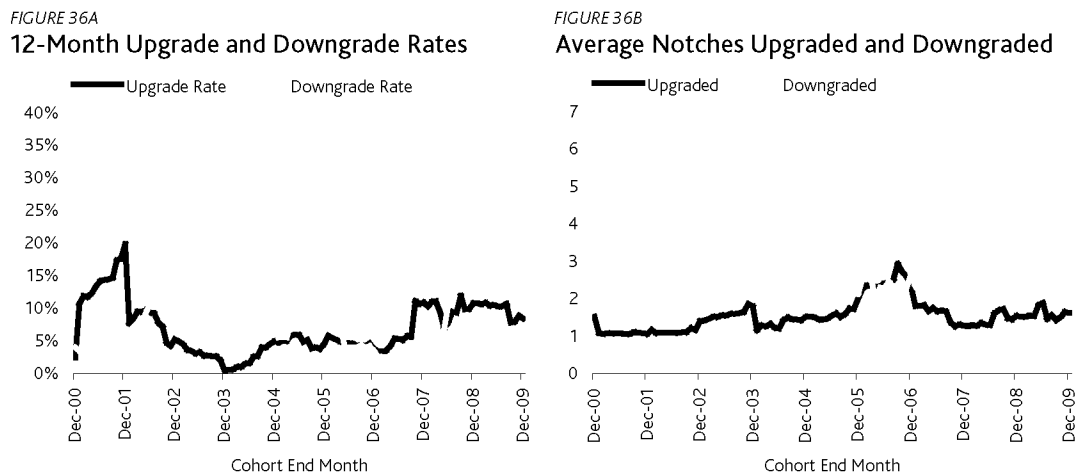
Repackaged securities and structured notes experienced a downgrade-to-upgrade ratio of 3.4 in 2009. In total, 452 ratings from 329 deals were downgraded and 133 ratings from 119 deals were upgraded. Structured notes comprised 58% of downgrades and 39% of upgrades and repackaged securities made up 41% of downgrades and 61% of upgrades.

The 12-month downgrade rate reached a high of 37% in July 2009, but declined to 28% by the end of the year (Figure 36A). The average magnitude of downgrades, fallen angel rate, and Aaa downgrade rate all followed a similar pattern of rising to a new high in early to mid-2009 and then declining in the latter half of the year (Figures 36B and 36C). Unlike most structured finance sectors, the sector experienced significant upgrade activity in 2009 with an overall upgrade rate of 8% for the year.

The Aaa rating category has experienced a higher stability rate of 77% (Figure 36D) compared to global structured finance (65%). In addition, the non-Aaa rating categories have also experienced lower cumulative downgrade rates in the range of 40%-50% compared to global structured finance where cumulative downgrade rates were roughly 55%-65%.

Figure 37 shows the transition matrix for global repackaged securities and structured notes for 2009. The performance of the sector was better than that of global structured finance. Securities rated single-A and higher had stability rates above 75%, most downgrades lowered the rating of the security by at most one broad rating category, and the percentage of securities that were downgraded to Caa and below was smaller.

Figure 36: Global Repackaged Securities and Structured Notes Rating Transition Trends







## Appendix I: Description of Data Sample and Glossary

The data sample used in this report includes all public, 144A, and private tranches with a published Moody's long-term global debt rating among global asset-backed securities (ABS), commercial and residential mortgage-backed securities (CMBS and RMBS), collateralized debt obligations (CDOs), and other structured finance, including covered bonds, asset-backed commercial paper (ABCP), derivative product companies (DPCs), insurance-linked securities such as catastrophe bonds, and structured investment vehicles (SIVs). Provisional ratings, credit estimates or evaluations, short-term ratings, and national scale ratings are not included. In addition, the following types of securities are excluded from the definition of global structured finance and are analyzed separately in the report: repackaged securities, structured notes, and other credit derivatives which are basically pass-throughs of the rating of another entity.

This data set is an expansion of data sets that were used in annual structured finance transition studies published prior to 2008. In particular, this data sample:

- » Includes tranches wrapped by financial guarantors, government agencies, and government sponsored enterprises (GSEs);
- » Includes interest-only (IO) and residual tranches;
- » Includes some transactions outside of the four major sectors (ABS, RMBS, CMBS, and CDOs) of structured finance, such as covered bonds, ABCP, DPCs, catastrophe bonds and SIVs;
- » Does not collapse tranches with the same rating from the same deal, i.e. all pari-passu tranches are counted in the data sample. The exceptions to this are notes with the same rating issued out of the same program for ABCP, SIVs and covered bonds, in which case only the rating of the program and not each individual security is counted.

The corporate data set used to compare corporate rating transitions to structured finance rating transitions includes international corporate and sovereign issuers, but excludes US municipal ratings.

*The data used to create this report are commercially available via Moody's Structured Finance Default Risk service and Moody's Corporate Default Risk service. For more information, please email [DefaultResearch@moodys.com](mailto:DefaultResearch@moodys.com)*

## Glossary

### Broad Ratings and Refined Ratings

Broad ratings refer to the following Moody's long-term bond rating categories: Aaa, Aa, A, Baa, Ba, B, and Caa-C. Refined ratings or ratings with numeric modifiers refer to Aaa, Aa1, Aa2, Aa3, A1, A2, A3, Baa1, Baa2, Baa3, Ba1, Ba2, Ba3, B1, B2, B3, Caa1, Caa2, Caa3, Ca, and C. The broad rating category Caa-C includes the following refined ratings: Caa1, Caa2, Caa3, Ca, and C.

### Investment-Grade (IG) and Below Investment-Grade (BIG)/Speculative-Grade (SG) Ratings

Investment-grade ratings refer to Aaa, Aa1, Aa2, Aa3, A1, A2, A3, Baa1, Baa2, and Baa3. Below investment-grade or speculative-grade ratings refer to Ba1, Ba2, Ba3, B1, B2, B3, Caa1, Caa2, Caa3, Ca, and C.

### Downgrade (Upgrade) Rate

A security is considered to have been downgraded (upgraded) if its rating at the end of a pre-specified time period is lower (higher) than at the beginning of the time period on the basis of ratings with numeric modifiers (also known as refined ratings or modified ratings). The downgrade (upgrade) rate is the number of securities downgraded (upgraded) divided by the total number of outstanding securities at the beginning of the time period. Note that in measuring downgrade rates and upgrade rates, only ratings at the beginning and the end of the time period are considered. If a rating was withdrawn by the end of the time period, then the rating prior to withdrawal is used as the end rating. Note that a security will only be counted if it was outstanding as of the cohort formation date.

### Average Number of Total Notches Downgraded (Upgraded) per 12-month Cohort

The number of total notches downgraded (upgraded) per 12-month cohort for a downgraded (upgraded) security is the difference in the rating of that security at the beginning and end of a 12-month period based on refined ratings. This term is also referred to as the magnitude, size, or severity of the rating change. The average number of total notches downgraded (upgraded) per 12-month cohort averages this quantity for all downgraded (upgraded) securities over the 12-month period. A security can experience multiple rating actions during a 12-month period, and therefore, this measure is different from the average number of notches changed per rating action. For example, if a security is downgraded from Baa1 to Baa2 and then Baa2 to Baa3 over 12 months, then the average number of notches changed per rating action would be one, but the average number of total notches changed per 12-month cohort would be two.

### Weighted Downgrade (Upgrade) Rate

The weighted downgrade (upgrade) rate is computed as the number of securities downgraded (upgraded), weighted by the number of total notches changed per downgrade (upgrade) per year, divided by the total number of outstanding securities at the beginning of the 12-month period. For example, a security downgraded from Baa1 to B1 over 12 months is counted as three downgrades in the calculation of a weighted downgrade rate, but counted as only one downgrade in the calculation of the unweighted downgrade rate.

### Fallen Angel Rate

A fallen angel is a security that was downgraded from an investment-grade rating to a below investment-grade rating. The fallen angel rate is the number of such securities over a 12-month period divided by the total number of investment grade securities outstanding at the beginning of the 12-month period. Note that a security will only be counted if it was outstanding as of the cohort formation date.

### Cumulative Downgrade (Upgrade) Rate

A security is considered to have experienced a cumulative or lifetime downgrade (upgrade), if its rating before withdrawal or rating at the end of the study period is lower (higher) than its original rating. The cumulative downgrade (upgrade) rate for a particular group of securities is computed as the number of securities to experience a cumulative downgrade (upgrade) divided by the total number of securities in the group.

### Downgrade-to-Upgrade Ratio (weighted)

The downgrade-to-upgrade ratio is calculated as the total number of downgraded ratings divided by the total number of upgraded ratings. The weighted downgrade-to-upgrade ratio is the number of downgraded ratings, weighted by the number of notches changed, divided by the number of upgraded ratings, weighted by the number of notches changed.

### Rating Drift

The rating drift is defined as the weighted upgrade rate minus the weighted downgrade rate.

### Rating Volatility

The rating volatility is defined as the weighted upgrade rate plus the weighted downgrade rate.

### Rating Stability Rate

The rating stability rate is a measure of the proportion of ratings that were unchanged over a pre-specified time period. It is calculated as one minus the sum of the downgrade rate and upgrade rate.

### ABS (ex HEL)

ABS stands for asset-backed securities. This structured finance sector includes securities backed by both traditional asset types such as auto loans, credit card receivables, student loans, and manufactured housing loans, and non-traditional asset types such as mutual fund fees, tax liens, tobacco settlement payments, and intellectual property. Home equity loans (HEL) are normally part of the ABS sector, but are explicitly excluded from ABS ex HEL.

### HEL

The home equity loan or HEL sector includes securities backed by subprime (B&C) mortgage loans, home improvement loans, high loan-to-value (high LTV) loans, home equity lines of credit (HELOCs), and closed-end second-lien loans, as well as net interest margin (NIM) securitizations. It does not include securities backed by Alt-A mortgages, which are included in the RMBS sector. HEL is part of the ABS sector.

Prior to 1998, RMBS collateral was generally defined as first-lien residential mortgages, regardless of the credit quality of the borrower. HEL collateral generally included junior liens such as HELOCs or closed-end seconds. However, as subprime lending became more prevalent, the market shifted its definition such that HEL encompassed subprime first-lien residential mortgages while RMBS included first-lien mortgages made to higher quality borrowers. Since 1998, a deal classified as RMBS by Moody's is generally backed by prime or Alt-A quality first-lien residential mortgages, while a deal classified as HEL is generally backed by subprime first-lien mortgages or junior liens. Therefore, a subprime deal which would be classified as HEL today may have been classified as RMBS in the past.

### RMBS

RMBS stand for residential mortgage-backed securities. The vast majority of these securities are backed by first-lien prime mortgages or by Alt-A mortgages. For further details, see the definition of HEL.

### CMBS

CMBS stand for commercial mortgage-backed securities. Commercial real estate (CRE) CDOs, where 70% or more of the collateral is comprised of CRE loans, are classified as CMBS. If the collateral backing the transaction contains less than 70% CRE loans, then the deal is classified as a CDO.

### CDOs

CDOs stand for collateralized debt obligations. Derivative securities such as structured notes and repackaged securities are not considered to be part of this sector. Commercial real estate (CRE) CDOs, where 70% or more of the collateral is comprised of CRE loans, are classified as CMBS. If the collateral backing the transaction contains less than 70% CRE loans, then the deal is classified as a CDO. CDO deal types include:

- » Balance sheet cash flow CDOs (BalSh CF CDO)
- » Balance sheet synthetic CDOs (BalSh Syn CDO)
- » High yield collateralized bond obligations (HY CBO)
- » Collateralized loan obligations (CLO)
- » Market value CDOs (MV CDO)
- » Small and medium enterprise CLOs (SME CLO)
- » Synthetic arbitrage CDOs (Syn Arb CDO)
- » Trust preferred securities CDOs (TRUP CDO)
- » Structured finance CDOs (SF CDO)

### Other Structured Finance

Other structured finance consists of structured finance securities not categorized in the four major sectors (ABS, RMBS, CMBS, and CDOs) including covered bonds, asset-backed commercial paper (ABCP), derivative product companies (DPCs), insurance-linked securities such as catastrophe bonds, and structured investment vehicles (SIVs). However, notes carrying only short-term ratings such as commercial paper are excluded.

### Global Structured Finance

Global structured finance captures securities issued around the world in the four major sectors – ABS, RMBS, CMBS, and CDOs – and in the Other Structured Finance category.

### US Structured Finance

US structured finance securities are denominated in US dollars and issued in the US market or denominated in Canadian dollars and issued in Canada. In cases where the source of the underlying collateral and the denomination of the securities cross multiple countries/regions, deals are classified by the location at which they are monitored.

### EMEA Structured Finance

EMEA is an abbreviation of Europe, the Middle East, and Africa. EMEA structured finance securities are denominated in a currency from or issued out of a country in the EMEA region. In cases where the source of the underlying collateral and the denomination of the securities cross multiple countries/regions, deals are classified by the location at which they are monitored.

**Asia-Pacific Structured Finance**

Asia-Pacific structured finance securities are denominated in the currency of a country in the Asia-Pacific region or issued in an Asia-Pacific country (including Japan and Australia). In cases where the source of the underlying collateral and the denomination of the securities cross multiple countries/regions, deals are classified by the location at which they are monitored

**Latin American Structured Finance**

Latin American structured finance securities are denominated in a Latin American currency or issued in Latin America. In cases where the source of the underlying collateral and the denomination of the securities cross multiple countries/regions, deals are classified by the location at which they are monitored.

**Global Repacks & Structured Notes**

This sector consists primarily of structured notes, repackaged securities, and other credit derivatives which are basically pass-throughs of the rating of another entity.

## Appendix II: Methodology

A rating transition matrix completely summarizes changes in credit ratings over a given time horizon. The cells of the matrix are discrete-time estimates of rating migration probabilities. They show the rate of rating change measured at two points in time; e.g. the start and end of one year.

The probability that rating  $i$  held on cohort date  $y$  will transition to rating  $j$  over a time horizon  $T$  is calculated as:

$$p_{ij}^y(T) = \frac{n_{ij}^y(T)}{n_i^y(0)},$$

where  $n_i^y(0)$  is the number of rating  $i$  outstanding on cohort date  $y$  and  $n_{ij}^y(T)$  is the number of those ratings that transition to  $j$  over time horizon  $T$ .

The weighted average rating transition rate for all cohorts  $y$  in the historical data set  $Y$  is calculated as:

$$\bar{p}_{ij}(T) = \frac{\sum_{y \in Y} n_{ij}^y(T)}{\sum_{y \in Y} n_i^y(0)}$$

Rating transition statistics can be reported by cohort rating or by original rating. For statistics calculated by cohort rating, every month the rating migrations of all outstanding securities are tracked over a pre-specified time horizon regardless of when the security was issued. For statistics calculated by original rating, every month the rating migration of all securities issued in that month are tracked over a pre-specified time horizon, in which case each security carries its original rating at the start of the period.

Unless otherwise stated, transition statistics in the report are calculated by cohort rating and usually the time horizon is one year. In any case, the rating (including WR) must exist over the entire time period in order to be counted, e.g. a rating must be seasoned at least three years to be counted in a three-year downgrade rate.

In comparing ratings at two points in time, there are two ways to deal with ratings that are withdrawn by the end of the time horizon. The WR can be treated as a distinct state or the last rating before withdrawal can be used as the end rating. Transition matrices using both methods are shown in the Appendix.

Within the main body of the report, the last rating before withdrawal is used so that if a security is downgraded or upgraded during the year and has its rating withdrawn by the end of the year, the downgrade or upgrade is still counted.<sup>18</sup>

<sup>18</sup> This differs from how withdrawals were treated in annual transition studies published prior to 2008 when rating changes prior to WR were not counted. In the structured finance transition studies published between 2005 and 2007, half the withdrawn ratings were deducted from the population, and in 2003 and 2004, all withdrawn ratings were deducted from the population.

Note that if a security is downgraded (upgraded) multiple times over the period under consideration, it will still be counted as one downgrade (upgrade). Moreover, if a tranche is downgraded and then upgraded (or upgraded and then downgraded) so that its start rating and end rating are the same, then no rating change will be considered as having occurred and neither the downgrade nor the upgrade will be counted.

In addition, when reporting the absolute number of downgrades and upgrades that occurred during the year, the rating change is counted regardless of when the rating was issued. In contrast, transition statistics by cohort rating only consider changes to ratings that were outstanding as of the cohort formation date. In particular, if a security was issued in 2007 and downgraded in the same year, then it would not be counted in the 12-month downgrade rate by cohort rating for 2007 because it had not been outstanding as of 1/1/07.

Appendix III: Multi-Year Transition Matrices<sup>19</sup>

Matrices by Cohort Rating

Figure 38: Global Structured Finance Rating Transition Matrices by Cohort Rating (1984-2009)

| 1-year  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  | WR     |
|---------|--------|--------|--------|--------|--------|--------|--------|--------|
| Aaa     | 79.91% | 1.63%  | 1.25%  | 1.12%  | 0.90%  | 1.09%  | 1.97%  | 12.14% |
| Aa      | 4.16%  | 73.57% | 3.57%  | 2.32%  | 1.75%  | 2.49%  | 5.72%  | 6.43%  |
| A       | 0.86%  | 2.74%  | 72.26% | 4.81%  | 2.80%  | 2.91%  | 7.18%  | 6.45%  |
| Baa     | 0.26%  | 0.38%  | 2.04%  | 70.83% | 4.60%  | 4.38%  | 11.72% | 5.79%  |
| Ba      | 0.10%  | 0.05%  | 0.30%  | 2.08%  | 66.33% | 4.76%  | 20.49% | 5.88%  |
| B       | 0.04%  | 0.02%  | 0.05%  | 0.19%  | 1.10%  | 56.15% | 37.37% | 5.08%  |
| Caa-C   | 0.01%  | 0.00%  | 0.00%  | 0.02%  | 0.04%  | 0.22%  | 87.63% | 12.08% |
| 3-year  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  | WR     |
| Aaa     | 54.76% | 1.60%  | 1.16%  | 1.10%  | 0.82%  | 0.90%  | 1.48%  | 38.18% |
| Aa      | 11.59% | 47.74% | 4.17%  | 2.62%  | 1.62%  | 1.23%  | 5.64%  | 25.38% |
| A       | 3.23%  | 6.03%  | 47.14% | 5.14%  | 3.06%  | 1.70%  | 8.26%  | 25.43% |
| Baa     | 1.25%  | 1.41%  | 5.07%  | 44.87% | 5.49%  | 4.30%  | 15.18% | 22.43% |
| Ba      | 0.43%  | 0.39%  | 1.45%  | 5.16%  | 46.55% | 5.13%  | 18.36% | 22.55% |
| B       | 0.12%  | 0.06%  | 0.24%  | 0.88%  | 3.48%  | 55.06% | 22.55% | 17.60% |
| Caa-C   | 0.05%  | 0.00%  | 0.02%  | 0.14%  | 0.24%  | 0.72%  | 72.01% | 26.81% |
| 5-year  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  | WR     |
| Aaa     | 35.70% | 1.04%  | 0.73%  | 0.41%  | 0.18%  | 0.20%  | 0.20%  | 61.54% |
| Aa      | 15.17% | 27.52% | 3.02%  | 1.96%  | 0.81%  | 0.83%  | 1.62%  | 49.08% |
| A       | 5.13%  | 5.99%  | 28.45% | 3.88%  | 2.27%  | 1.12%  | 3.16%  | 50.00% |
| Baa     | 2.60%  | 2.33%  | 6.21%  | 27.49% | 4.30%  | 3.17%  | 10.71% | 43.18% |
| Ba      | 0.70%  | 0.66%  | 2.31%  | 6.47%  | 29.79% | 4.48%  | 15.66% | 39.93% |
| B       | 0.14%  | 0.05%  | 0.25%  | 1.47%  | 3.27%  | 35.77% | 26.16% | 32.89% |
| Caa-C   | 0.00%  | 0.00%  | 0.01%  | 0.13%  | 0.23%  | 0.42%  | 54.99% | 44.22% |
| 7-year  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  | WR     |
| Aaa     | 22.20% | 0.56%  | 0.50%  | 0.30%  | 0.14%  | 0.18%  | 0.15%  | 75.97% |
| Aa      | 11.71% | 15.31% | 1.79%  | 1.28%  | 0.49%  | 0.77%  | 1.48%  | 67.17% |
| A       | 5.21%  | 3.64%  | 16.42% | 2.35%  | 1.05%  | 0.70%  | 2.62%  | 68.01% |
| Baa     | 3.66%  | 2.46%  | 5.10%  | 15.36% | 2.15%  | 2.31%  | 11.14% | 57.82% |
| Ba      | 0.68%  | 0.85%  | 2.44%  | 4.81%  | 16.48% | 3.18%  | 16.57% | 54.99% |
| B       | 0.21%  | 0.04%  | 0.16%  | 1.45%  | 2.11%  | 21.21% | 24.72% | 50.11% |
| Caa-C   | 0.00%  | 0.00%  | 0.02%  | 0.00%  | 0.26%  | 0.37%  | 39.22% | 60.13% |
| 10-year | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  | WR     |
| Aaa     | 12.30% | 0.32%  | 0.38%  | 0.20%  | 0.08%  | 0.08%  | 0.05%  | 86.60% |
| Aa      | 4.95%  | 7.42%  | 0.79%  | 0.45%  | 0.16%  | 0.35%  | 0.88%  | 85.00% |
| A       | 1.84%  | 1.24%  | 8.74%  | 0.73%  | 0.18%  | 0.24%  | 1.51%  | 85.53% |
| Baa     | 2.46%  | 0.83%  | 1.52%  | 7.64%  | 1.42%  | 1.96%  | 9.55%  | 74.62% |
| Ba      | 0.76%  | 0.95%  | 1.44%  | 1.38%  | 6.06%  | 1.34%  | 11.78% | 76.29% |
| B       | 0.09%  | 0.07%  | 0.35%  | 1.49%  | 1.02%  | 7.02%  | 13.23% | 76.73% |
| Caa-C   | 0.00%  | 0.00%  | 0.05%  | 0.00%  | 0.00%  | 0.41%  | 29.21% | 70.32% |

<sup>19</sup> The transition matrices in Appendix III are also available in an [Excel Data Supplement](#) on moodys.com.



**Figure 39 - Global Structured Finance excl SF CDOs, Other SF, and '05-'07 vintage US HEL & RMBS Rating Transition Matrices by Cohort Rating (1984-2009)**

| <b>1-year</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> | <b>WR</b> |
|----------------|------------|-----------|----------|------------|-----------|----------|--------------|-----------|
| Aaa            | 83.44%     | 1.16%     | 0.69%    | 0.37%      | 0.14%     | 0.08%    | 0.05%        | 14.07%    |
| Aa             | 5.51%      | 79.67%    | 3.19%    | 1.62%      | 0.57%     | 0.48%    | 0.64%        | 8.30%     |
| A              | 1.09%      | 3.38%     | 79.08%   | 4.24%      | 2.10%     | 0.95%    | 1.39%        | 7.77%     |
| Baa            | 0.32%      | 0.47%     | 2.63%    | 79.02%     | 4.43%     | 3.21%    | 3.14%        | 6.78%     |
| Ba             | 0.14%      | 0.07%     | 0.39%    | 2.65%      | 76.89%    | 4.71%    | 9.30%        | 5.85%     |
| B              | 0.06%      | 0.03%     | 0.07%    | 0.27%      | 1.56%     | 77.27%   | 15.53%       | 5.23%     |
| Caa-C          | 0.02%      | 0.00%     | 0.00%    | 0.04%      | 0.06%     | 0.42%    | 89.67%       | 9.78%     |
| <b>3-year</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> | <b>WR</b> |
| Aaa            | 56.54%     | 1.26%     | 0.84%    | 0.49%      | 0.18%     | 0.17%    | 0.10%        | 40.43%    |
| Aa             | 13.16%     | 50.37%    | 3.67%    | 2.16%      | 0.82%     | 0.55%    | 0.97%        | 28.30%    |
| A              | 3.66%      | 6.62%     | 50.81%   | 4.84%      | 2.65%     | 1.17%    | 2.34%        | 27.91%    |
| Baa            | 1.44%      | 1.61%     | 5.83%    | 49.61%     | 5.70%     | 4.24%    | 7.38%        | 24.20%    |
| Ba             | 0.49%      | 0.44%     | 1.65%    | 5.68%      | 51.13%    | 5.47%    | 13.49%       | 21.66%    |
| B              | 0.13%      | 0.07%     | 0.25%    | 0.91%      | 3.54%     | 55.82%   | 21.57%       | 17.71%    |
| Caa-C          | 0.05%      | 0.00%     | 0.02%    | 0.12%      | 0.17%     | 0.67%    | 71.33%       | 27.64%    |
| <b>5-year</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> | <b>WR</b> |
| Aaa            | 35.54%     | 0.97%     | 0.70%    | 0.39%      | 0.15%     | 0.17%    | 0.11%        | 61.98%    |
| Aa             | 15.39%     | 27.60%    | 2.97%    | 1.93%      | 0.72%     | 0.76%    | 1.17%        | 49.46%    |
| A              | 5.22%      | 5.94%     | 28.62%   | 3.85%      | 2.26%     | 1.12%    | 2.73%        | 50.25%    |
| Baa            | 2.68%      | 2.40%     | 6.35%    | 27.94%     | 4.37%     | 3.18%    | 9.52%        | 43.55%    |
| Ba             | 0.72%      | 0.69%     | 2.38%    | 6.51%      | 30.49%    | 4.56%    | 15.26%       | 39.39%    |
| B              | 0.14%      | 0.05%     | 0.25%    | 1.48%      | 3.21%     | 35.96%   | 25.95%       | 32.96%    |
| Caa-C          | 0.00%      | 0.00%     | 0.01%    | 0.13%      | 0.21%     | 0.40%    | 54.75%       | 44.49%    |
| <b>7-year</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> | <b>WR</b> |
| Aaa            | 21.94%     | 0.52%     | 0.49%    | 0.29%      | 0.12%     | 0.16%    | 0.13%        | 76.35%    |
| Aa             | 11.74%     | 15.23%    | 1.77%    | 1.29%      | 0.46%     | 0.74%    | 1.31%        | 67.48%    |
| A              | 5.26%      | 3.63%     | 16.44%   | 2.30%      | 1.05%     | 0.71%    | 2.44%        | 68.17%    |
| Baa            | 3.72%      | 2.50%     | 5.16%    | 15.50%     | 2.15%     | 2.31%    | 10.41%       | 58.23%    |
| Ba             | 0.69%      | 0.86%     | 2.44%    | 4.86%      | 16.58%    | 3.22%    | 16.55%       | 54.80%    |
| B              | 0.21%      | 0.04%     | 0.16%    | 1.45%      | 2.01%     | 21.27%   | 24.78%       | 50.08%    |
| Caa-C          | 0.00%      | 0.00%     | 0.02%    | 0.00%      | 0.26%     | 0.37%    | 39.19%       | 60.16%    |
| <b>10-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> | <b>WR</b> |
| Aaa            | 12.01%     | 0.30%     | 0.38%    | 0.20%      | 0.08%     | 0.08%    | 0.05%        | 86.91%    |
| Aa             | 4.90%      | 7.37%     | 0.76%    | 0.45%      | 0.16%     | 0.35%    | 0.89%        | 85.13%    |
| A              | 1.85%      | 1.24%     | 8.77%    | 0.73%      | 0.18%     | 0.24%    | 1.51%        | 85.47%    |
| Baa            | 2.47%      | 0.83%     | 1.53%    | 7.66%      | 1.42%     | 1.96%    | 9.58%        | 74.55%    |
| Ba             | 0.77%      | 0.95%     | 1.45%    | 1.39%      | 6.03%     | 1.35%    | 11.86%       | 76.21%    |
| B              | 0.09%      | 0.07%     | 0.35%    | 1.50%      | 1.02%     | 7.05%    | 13.28%       | 76.65%    |
| Caa-C          | 0.00%      | 0.00%     | 0.05%    | 0.00%      | 0.00%     | 0.41%    | 29.21%       | 70.32%    |

Figure 40 - US ABS ex HEL Rating Transition Matrices by Cohort Rating (1984-2009)

| 1-year  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  | WR     |
|---------|--------|--------|--------|--------|--------|--------|--------|--------|
| Aaa     | 81.88% | 1.46%  | 1.13%  | 0.55%  | 0.18%  | 0.11%  | 0.05%  | 14.65% |
| Aa      | 2.54%  | 77.61% | 4.55%  | 2.26%  | 0.69%  | 0.85%  | 0.85%  | 10.64% |
| A       | 0.74%  | 2.29%  | 79.91% | 3.82%  | 0.95%  | 0.77%  | 0.77%  | 10.75% |
| Baa     | 0.34%  | 0.41%  | 1.34%  | 80.91% | 4.66%  | 2.00%  | 1.78%  | 8.56%  |
| Ba      | 0.12%  | 0.07%  | 0.27%  | 4.83%  | 69.49% | 7.10%  | 10.91% | 7.21%  |
| B       | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.05%  | 71.68% | 25.24% | 3.03%  |
| Caa-C   | 0.00%  | 0.00%  | 0.00%  | 0.01%  | 0.04%  | 0.06%  | 90.58% | 9.30%  |
| 3-year  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  | WR     |
| Aaa     | 52.23% | 1.61%  | 1.49%  | 0.72%  | 0.32%  | 0.35%  | 0.20%  | 43.08% |
| Aa      | 3.84%  | 51.53% | 3.77%  | 4.15%  | 1.61%  | 1.56%  | 2.94%  | 30.60% |
| A       | 1.27%  | 2.63%  | 51.61% | 3.49%  | 1.98%  | 0.95%  | 2.15%  | 35.91% |
| Baa     | 0.76%  | 0.72%  | 1.67%  | 52.17% | 6.06%  | 2.92%  | 6.58%  | 29.12% |
| Ba      | 0.32%  | 0.38%  | 0.26%  | 5.14%  | 34.75% | 7.25%  | 28.61% | 23.28% |
| B       | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 41.43% | 47.53% | 11.04% |
| Caa-C   | 0.00%  | 0.00%  | 0.00%  | 0.02%  | 0.11%  | 0.06%  | 74.64% | 25.17% |
| 5-year  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  | WR     |
| Aaa     | 32.57% | 1.23%  | 1.45%  | 0.74%  | 0.41%  | 0.52%  | 0.37%  | 62.71% |
| Aa      | 3.82%  | 32.12% | 3.09%  | 3.76%  | 1.28%  | 2.86%  | 5.31%  | 47.76% |
| A       | 1.00%  | 1.71%  | 30.86% | 2.96%  | 2.13%  | 0.89%  | 3.01%  | 57.44% |
| Baa     | 0.54%  | 0.52%  | 1.07%  | 31.81% | 5.83%  | 3.32%  | 13.25% | 43.66% |
| Ba      | 0.34%  | 0.26%  | 0.00%  | 5.04%  | 9.43%  | 4.23%  | 45.13% | 35.57% |
| B       | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 16.64% | 58.77% | 24.59% |
| Caa-C   | 0.00%  | 0.00%  | 0.00%  | 0.05%  | 0.03%  | 0.00%  | 54.51% | 45.41% |
| 7-year  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  | WR     |
| Aaa     | 21.06% | 1.14%  | 1.36%  | 0.66%  | 0.46%  | 0.53%  | 0.51%  | 74.27% |
| Aa      | 3.14%  | 20.18% | 2.20%  | 2.96%  | 0.92%  | 3.12%  | 5.81%  | 61.67% |
| A       | 0.71%  | 1.43%  | 19.38% | 2.45%  | 0.96%  | 0.63%  | 2.80%  | 71.64% |
| Baa     | 0.65%  | 0.78%  | 1.09%  | 18.91% | 2.76%  | 3.56%  | 21.09% | 51.18% |
| Ba      | 0.50%  | 0.43%  | 0.00%  | 0.13%  | 3.84%  | 0.85%  | 47.58% | 46.67% |
| B       | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 10.55% | 43.38% | 46.08% |
| Caa-C   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 28.31% | 71.69% |
| 10-year | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  | WR     |
| Aaa     | 11.22% | 0.91%  | 0.91%  | 0.39%  | 0.31%  | 0.24%  | 0.12%  | 85.89% |
| Aa      | 1.89%  | 11.25% | 1.56%  | 1.01%  | 0.39%  | 1.64%  | 3.31%  | 78.94% |
| A       | 0.15%  | 0.61%  | 10.65% | 0.33%  | 0.04%  | 0.20%  | 0.83%  | 87.19% |
| Baa     | 0.24%  | 0.94%  | 0.62%  | 10.69% | 2.68%  | 4.02%  | 23.32% | 57.50% |
| Ba      | 1.42%  | 0.73%  | 0.41%  | 0.00%  | 1.67%  | 0.00%  | 34.28% | 61.49% |
| B       | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 11.41% | 17.66% | 70.92% |
| Caa-C   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 13.33% | 86.67% |

Figure 41 - US HEL Rating Transition Matrices by Cohort Rating (1989-2009)

| 1-year  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  | WR     |
|---------|--------|--------|--------|--------|--------|--------|--------|--------|
| Aaa     | 76.87% | 1.91%  | 1.42%  | 1.53%  | 0.97%  | 1.02%  | 0.86%  | 15.43% |
| Aa      | 1.35%  | 72.74% | 4.54%  | 3.19%  | 2.85%  | 4.32%  | 7.74%  | 3.26%  |
| A       | 0.18%  | 1.25%  | 68.66% | 7.24%  | 3.87%  | 5.54%  | 10.37% | 2.89%  |
| Baa     | 0.06%  | 0.13%  | 0.62%  | 64.73% | 6.11%  | 6.53%  | 18.06% | 3.76%  |
| Ba      | 0.00%  | 0.04%  | 0.05%  | 0.35%  | 45.88% | 6.47%  | 41.00% | 6.22%  |
| B       | 0.00%  | 0.00%  | 0.03%  | 0.03%  | 0.07%  | 19.74% | 73.73% | 6.39%  |
| Caa-C   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 83.29% | 16.71% |
| 3-year  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  | WR     |
| Aaa     | 47.74% | 1.46%  | 1.09%  | 1.15%  | 0.69%  | 0.76%  | 1.02%  | 46.09% |
| Aa      | 5.02%  | 54.72% | 7.42%  | 3.83%  | 2.35%  | 2.04%  | 8.47%  | 16.15% |
| A       | 0.52%  | 4.44%  | 46.94% | 10.71% | 5.21%  | 3.45%  | 15.77% | 12.96% |
| Baa     | 0.07%  | 0.29%  | 1.96%  | 38.48% | 8.89%  | 7.41%  | 27.48% | 15.41% |
| Ba      | 0.00%  | 0.17%  | 0.21%  | 0.87%  | 25.76% | 5.71%  | 41.37% | 25.91% |
| B       | 0.00%  | 0.00%  | 0.71%  | 0.71%  | 0.99%  | 33.38% | 37.54% | 26.67% |
| Caa-C   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 55.88% | 44.12% |
| 5-year  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  | WR     |
| Aaa     | 30.63% | 1.08%  | 0.83%  | 0.82%  | 0.20%  | 0.33%  | 0.21%  | 65.91% |
| Aa      | 7.05%  | 38.62% | 7.52%  | 3.98%  | 0.62%  | 0.41%  | 0.47%  | 41.34% |
| A       | 1.22%  | 5.53%  | 34.58% | 11.57% | 4.55%  | 2.75%  | 4.21%  | 35.60% |
| Baa     | 0.07%  | 0.56%  | 2.40%  | 27.42% | 8.15%  | 6.19%  | 20.72% | 34.49% |
| Ba      | 0.09%  | 0.30%  | 0.81%  | 1.45%  | 26.72% | 6.27%  | 27.31% | 37.05% |
| B       | 0.45%  | 0.00%  | 0.64%  | 1.68%  | 1.68%  | 16.26% | 30.75% | 48.54% |
| Caa-C   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 30.79% | 69.21% |
| 7-year  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  | WR     |
| Aaa     | 16.61% | 0.95%  | 0.99%  | 0.62%  | 0.16%  | 0.32%  | 0.15%  | 80.20% |
| Aa      | 5.84%  | 20.87% | 5.36%  | 4.32%  | 0.74%  | 0.41%  | 1.23%  | 61.22% |
| A       | 1.74%  | 3.17%  | 18.59% | 6.39%  | 2.24%  | 2.15%  | 4.95%  | 60.77% |
| Baa     | 0.00%  | 0.79%  | 2.50%  | 15.81% | 4.28%  | 2.96%  | 18.65% | 54.99% |
| Ba      | 0.23%  | 0.00%  | 1.18%  | 1.03%  | 16.67% | 5.24%  | 23.65% | 52.01% |
| B       | 0.53%  | 0.21%  | 0.00%  | 2.52%  | 1.17%  | 5.94%  | 22.48% | 67.14% |
| Caa-C   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 12.37% | 87.63% |
| 10-year | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  | WR     |
| Aaa     | 7.61%  | 0.74%  | 1.25%  | 0.56%  | 0.18%  | 0.29%  | 0.14%  | 89.24% |
| Aa      | 5.39%  | 11.86% | 1.57%  | 2.72%  | 0.34%  | 0.15%  | 1.55%  | 76.44% |
| A       | 2.70%  | 1.49%  | 12.64% | 3.61%  | 0.88%  | 1.02%  | 4.25%  | 73.42% |
| Baa     | 0.00%  | 1.06%  | 1.71%  | 9.38%  | 4.28%  | 1.93%  | 14.78% | 66.86% |
| Ba      | 0.12%  | 0.00%  | 1.47%  | 0.00%  | 8.13%  | 1.20%  | 15.18% | 73.90% |
| B       | 0.00%  | 0.18%  | 0.00%  | 2.27%  | 0.00%  | 1.60%  | 8.24%  | 87.71% |
| Caa-C   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 3.21%  | 96.79% |

Figure 42 - US RMBS Rating Transition Matrices by Cohort Rating (1984-2009)

| 1-year  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  | WR     |
|---------|--------|--------|--------|--------|--------|--------|--------|--------|
| Aaa     | 79.59% | 1.37%  | 1.27%  | 1.32%  | 1.18%  | 1.61%  | 3.07%  | 10.60% |
| Aa      | 5.26%  | 72.79% | 2.13%  | 1.87%  | 1.81%  | 2.96%  | 7.19%  | 5.99%  |
| A       | 0.90%  | 3.32%  | 66.52% | 3.32%  | 2.52%  | 4.91%  | 13.83% | 4.68%  |
| Baa     | 0.25%  | 0.37%  | 2.84%  | 66.49% | 2.73%  | 3.90%  | 19.14% | 4.28%  |
| Ba      | 0.08%  | 0.08%  | 0.63%  | 3.53%  | 64.16% | 2.51%  | 25.00% | 4.01%  |
| B       | 0.00%  | 0.03%  | 0.07%  | 0.23%  | 2.11%  | 49.05% | 44.87% | 3.65%  |
| Caa-C   | 0.00%  | 0.00%  | 0.01%  | 0.00%  | 0.04%  | 0.00%  | 94.67% | 5.29%  |
| 3-year  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  | WR     |
| Aaa     | 57.29% | 1.39%  | 1.08%  | 1.32%  | 1.10%  | 1.27%  | 1.97%  | 34.59% |
| Aa      | 15.67% | 46.37% | 2.67%  | 1.85%  | 1.42%  | 0.97%  | 5.77%  | 25.28% |
| A       | 4.73%  | 8.77%  | 44.47% | 2.87%  | 2.33%  | 1.97%  | 13.57% | 21.29% |
| Baa     | 1.15%  | 1.90%  | 7.74%  | 46.63% | 2.29%  | 2.12%  | 18.14% | 20.03% |
| Ba      | 0.50%  | 0.28%  | 3.83%  | 9.44%  | 51.01% | 2.37%  | 13.57% | 19.00% |
| B       | 0.12%  | 0.17%  | 0.30%  | 1.34%  | 7.82%  | 55.56% | 12.30% | 22.40% |
| Caa-C   | 0.00%  | 0.00%  | 0.04%  | 0.00%  | 0.63%  | 0.00%  | 77.05% | 22.28% |
| 5-year  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  | WR     |
| Aaa     | 38.17% | 0.73%  | 0.43%  | 0.15%  | 0.02%  | 0.02%  | 0.00%  | 60.48% |
| Aa      | 19.67% | 26.61% | 2.03%  | 1.01%  | 0.37%  | 0.34%  | 0.26%  | 49.71% |
| A       | 8.23%  | 9.53%  | 27.42% | 2.38%  | 1.61%  | 1.00%  | 2.47%  | 47.35% |
| Baa     | 2.53%  | 2.88%  | 9.04%  | 32.63% | 1.74%  | 1.79%  | 4.75%  | 44.63% |
| Ba      | 0.81%  | 0.59%  | 5.50%  | 9.76%  | 33.58% | 2.40%  | 6.32%  | 41.04% |
| B       | 0.31%  | 0.17%  | 0.21%  | 2.32%  | 6.12%  | 35.78% | 10.02% | 45.07% |
| Caa-C   | 0.00%  | 0.00%  | 0.04%  | 0.00%  | 0.89%  | 0.00%  | 65.22% | 33.85% |
| 7-year  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  | WR     |
| Aaa     | 23.50% | 0.12%  | 0.10%  | 0.11%  | 0.01%  | 0.02%  | 0.00%  | 76.14% |
| Aa      | 13.69% | 14.29% | 1.18%  | 0.48%  | 0.19%  | 0.29%  | 0.30%  | 69.59% |
| A       | 6.93%  | 5.72%  | 15.13% | 1.28%  | 0.61%  | 0.36%  | 1.84%  | 68.13% |
| Baa     | 2.65%  | 1.76%  | 6.14%  | 19.98% | 0.69%  | 1.54%  | 3.14%  | 64.09% |
| Ba      | 0.56%  | 0.87%  | 3.68%  | 6.17%  | 19.15% | 1.59%  | 4.48%  | 63.50% |
| B       | 0.42%  | 0.05%  | 0.29%  | 1.78%  | 2.03%  | 21.64% | 6.95%  | 66.83% |
| Caa-C   | 0.00%  | 0.00%  | 0.06%  | 0.00%  | 0.99%  | 0.00%  | 53.74% | 45.21% |
| 10-year | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  | WR     |
| Aaa     | 13.08% | 0.03%  | 0.07%  | 0.09%  | 0.00%  | 0.00%  | 0.01%  | 86.72% |
| Aa      | 5.52%  | 6.55%  | 0.62%  | 0.23%  | 0.12%  | 0.15%  | 0.43%  | 86.38% |
| A       | 3.50%  | 2.29%  | 6.80%  | 0.78%  | 0.21%  | 0.18%  | 2.10%  | 84.13% |
| Baa     | 1.39%  | 0.57%  | 2.27%  | 8.22%  | 0.34%  | 1.22%  | 2.84%  | 83.16% |
| Ba      | 0.16%  | 0.68%  | 0.75%  | 1.14%  | 7.91%  | 1.58%  | 4.84%  | 82.94% |
| B       | 0.12%  | 0.09%  | 0.62%  | 0.64%  | 0.94%  | 7.96%  | 7.10%  | 82.53% |
| Caa-C   | 0.00%  | 0.00%  | 0.10%  | 0.00%  | 0.00%  | 0.00%  | 41.67% | 58.23% |

Figure 43 - US CMBS Rating Transition Matrices by Cohort Rating (1987-2009)

| 1-year  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  | WR     |
|---------|--------|--------|--------|--------|--------|--------|--------|--------|
| Aaa     | 88.99% | 0.95%  | 0.75%  | 0.22%  | 0.18%  | 0.05%  | 0.03%  | 8.82%  |
| Aa      | 13.88% | 71.98% | 3.97%  | 2.28%  | 0.75%  | 0.68%  | 0.23%  | 6.23%  |
| A       | 3.27%  | 8.51%  | 74.47% | 4.44%  | 2.68%  | 0.95%  | 1.02%  | 4.66%  |
| Baa     | 0.75%  | 1.06%  | 5.68%  | 77.22% | 4.30%  | 3.15%  | 1.93%  | 5.91%  |
| Ba      | 0.20%  | 0.02%  | 0.38%  | 2.66%  | 84.02% | 3.74%  | 6.23%  | 2.75%  |
| B       | 0.10%  | 0.01%  | 0.02%  | 0.13%  | 0.85%  | 85.16% | 11.93% | 1.81%  |
| Caa-C   | 0.06%  | 0.00%  | 0.00%  | 0.00%  | 0.13%  | 0.78%  | 91.93% | 7.10%  |
| 3-year  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  | WR     |
| Aaa     | 70.61% | 0.91%  | 0.31%  | 0.12%  | 0.05%  | 0.02%  | 0.05%  | 27.94% |
| Aa      | 32.45% | 37.97% | 2.85%  | 1.11%  | 0.69%  | 0.23%  | 0.26%  | 24.44% |
| A       | 15.71% | 16.91% | 42.64% | 3.62%  | 1.60%  | 0.38%  | 0.51%  | 18.62% |
| Baa     | 5.29%  | 4.88%  | 13.40% | 48.97% | 3.32%  | 1.77%  | 1.37%  | 21.01% |
| Ba      | 0.90%  | 0.66%  | 1.78%  | 7.27%  | 68.61% | 6.05%  | 4.56%  | 10.18% |
| B       | 0.12%  | 0.01%  | 0.19%  | 0.59%  | 2.11%  | 70.34% | 19.18% | 7.45%  |
| Caa-C   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.07%  | 1.95%  | 77.61% | 20.37% |
| 5-year  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  | WR     |
| Aaa     | 53.37% | 0.67%  | 0.18%  | 0.02%  | 0.00%  | 0.00%  | 0.00%  | 45.76% |
| Aa      | 37.55% | 17.65% | 1.43%  | 0.48%  | 0.64%  | 0.00%  | 0.28%  | 41.97% |
| A       | 26.92% | 17.29% | 20.40% | 2.48%  | 0.63%  | 0.07%  | 0.02%  | 32.20% |
| Baa     | 10.73% | 7.75%  | 16.15% | 26.97% | 1.83%  | 0.53%  | 0.64%  | 35.39% |
| Ba      | 1.52%  | 1.71%  | 3.11%  | 10.63% | 51.87% | 7.40%  | 4.39%  | 19.38% |
| B       | 0.01%  | 0.00%  | 0.31%  | 1.22%  | 2.57%  | 51.49% | 28.19% | 16.20% |
| Caa-C   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 3.02%  | 63.69% | 33.30% |
| 7-year  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  | WR     |
| Aaa     | 38.35% | 0.43%  | 0.40%  | 0.08%  | 0.00%  | 0.00%  | 0.00%  | 60.74% |
| Aa      | 28.61% | 10.18% | 1.08%  | 0.45%  | 0.50%  | 0.00%  | 0.35%  | 58.84% |
| A       | 33.13% | 9.70%  | 8.38%  | 1.48%  | 0.23%  | 0.01%  | 0.12%  | 46.95% |
| Baa     | 15.83% | 9.14%  | 14.27% | 11.37% | 1.05%  | 0.62%  | 1.30%  | 46.42% |
| Ba      | 1.96%  | 2.59%  | 5.29%  | 11.69% | 32.69% | 7.22%  | 8.08%  | 30.48% |
| B       | 0.03%  | 0.00%  | 0.17%  | 1.64%  | 3.28%  | 33.29% | 33.82% | 27.78% |
| Caa-C   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 3.01%  | 55.32% | 41.67% |
| 10-year | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  | WR     |
| Aaa     | 13.36% | 0.32%  | 1.18%  | 0.03%  | 0.00%  | 0.00%  | 0.00%  | 85.11% |
| Aa      | 5.01%  | 6.41%  | 0.42%  | 0.06%  | 0.00%  | 0.00%  | 0.68%  | 87.42% |
| A       | 7.00%  | 0.70%  | 2.85%  | 0.92%  | 0.00%  | 0.00%  | 0.17%  | 88.36% |
| Baa     | 14.54% | 2.09%  | 1.44%  | 1.41%  | 0.62%  | 1.30%  | 1.50%  | 77.10% |
| Ba      | 3.17%  | 3.20%  | 5.24%  | 4.89%  | 5.18%  | 2.42%  | 12.51% | 63.40% |
| B       | 0.11%  | 0.00%  | 0.19%  | 3.64%  | 2.37%  | 10.35% | 22.67% | 60.67% |
| Caa-C   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 3.36%  | 43.70% | 52.94% |

Figure 44 - US CDO Rating Transition Matrices by Cohort Rating (1990-2009)

| 1-year  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  | WR     |
|---------|--------|--------|--------|--------|--------|--------|--------|--------|
| Aaa     | 75.73% | 4.58%  | 2.59%  | 1.53%  | 1.95%  | 1.53%  | 5.16%  | 6.93%  |
| Aa      | 1.11%  | 70.02% | 5.61%  | 3.35%  | 2.27%  | 2.19%  | 9.41%  | 6.05%  |
| A       | 0.48%  | 1.02%  | 66.66% | 5.87%  | 5.86%  | 1.94%  | 11.98% | 6.18%  |
| Baa     | 0.16%  | 0.30%  | 0.54%  | 68.12% | 5.44%  | 5.58%  | 13.74% | 6.12%  |
| Ba      | 0.04%  | 0.08%  | 0.18%  | 0.76%  | 63.96% | 5.74%  | 22.07% | 7.16%  |
| B       | 0.00%  | 0.08%  | 0.16%  | 0.70%  | 1.40%  | 46.45% | 42.47% | 8.74%  |
| Caa-C   | 0.00%  | 0.00%  | 0.00%  | 0.06%  | 0.07%  | 0.38%  | 86.94% | 12.55% |
| 3-year  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  | WR     |
| Aaa     | 53.41% | 6.24%  | 3.58%  | 1.95%  | 2.09%  | 1.50%  | 6.67%  | 24.56% |
| Aa      | 2.91%  | 42.91% | 7.77%  | 5.17%  | 3.11%  | 2.45%  | 11.45% | 24.24% |
| A       | 1.48%  | 2.85%  | 41.09% | 6.35%  | 6.41%  | 2.41%  | 14.27% | 25.15% |
| Baa     | 0.60%  | 0.82%  | 1.29%  | 39.51% | 6.88%  | 7.36%  | 19.90% | 23.64% |
| Ba      | 0.13%  | 0.45%  | 0.38%  | 2.40%  | 38.22% | 6.31%  | 24.21% | 27.91% |
| B       | 0.24%  | 0.13%  | 0.23%  | 1.90%  | 3.63%  | 29.74% | 36.47% | 27.65% |
| Caa-C   | 0.00%  | 0.00%  | 0.07%  | 0.45%  | 0.49%  | 1.43%  | 78.10% | 19.45% |
| 5-year  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  | WR     |
| Aaa     | 34.19% | 5.56%  | 3.03%  | 1.97%  | 1.98%  | 1.29%  | 2.97%  | 49.01% |
| Aa      | 4.01%  | 21.32% | 6.03%  | 5.49%  | 3.74%  | 2.41%  | 7.74%  | 49.27% |
| A       | 1.94%  | 3.95%  | 19.75% | 4.57%  | 4.74%  | 2.24%  | 10.28% | 52.54% |
| Baa     | 0.57%  | 1.05%  | 1.40%  | 17.43% | 6.13%  | 5.95%  | 22.33% | 45.14% |
| Ba      | 0.17%  | 0.27%  | 0.31%  | 2.24%  | 17.09% | 4.90%  | 24.64% | 50.37% |
| B       | 0.09%  | 0.00%  | 0.14%  | 1.43%  | 2.60%  | 15.44% | 39.27% | 41.04% |
| Caa-C   | 0.00%  | 0.00%  | 0.00%  | 0.45%  | 0.38%  | 0.37%  | 68.60% | 30.21% |
| 7-year  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  | WR     |
| Aaa     | 22.90% | 3.67%  | 1.36%  | 1.20%  | 1.31%  | 1.04%  | 1.61%  | 66.92% |
| Aa      | 5.19%  | 10.53% | 4.25%  | 4.09%  | 2.90%  | 1.95%  | 6.60%  | 64.49% |
| A       | 1.83%  | 3.33%  | 7.11%  | 3.31%  | 3.50%  | 1.76%  | 7.75%  | 71.41% |
| Baa     | 0.42%  | 1.00%  | 0.97%  | 6.72%  | 3.94%  | 4.96%  | 24.70% | 57.30% |
| Ba      | 0.11%  | 0.00%  | 0.39%  | 1.06%  | 5.27%  | 3.11%  | 28.57% | 61.49% |
| B       | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 1.00%  | 5.33%  | 45.53% | 48.14% |
| Caa-C   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 64.38% | 35.62% |
| 10-year | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  | WR     |
| Aaa     | 13.43% | 1.69%  | 0.39%  | 0.07%  | 0.45%  | 0.30%  | 0.19%  | 83.48% |
| Aa      | 1.60%  | 4.86%  | 0.47%  | 1.69%  | 0.52%  | 1.62%  | 3.31%  | 85.94% |
| A       | 0.54%  | 0.13%  | 1.66%  | 0.63%  | 0.18%  | 0.00%  | 5.55%  | 91.32% |
| Baa     | 0.40%  | 0.13%  | 0.17%  | 1.50%  | 0.78%  | 2.63%  | 20.28% | 74.10% |
| Ba      | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.12%  | 27.26% | 72.61% |
| B       | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 1.02%  | 34.84% | 64.14% |
| Caa-C   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 66.67% | 33.33% |

**Figure 45 - Global Structured Finance Rating Transition Matrices by Cohort Rating using Rating before WR (1984-2009)**

| <b>1-year</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
|----------------|------------|-----------|----------|------------|-----------|----------|--------------|
| Aaa            | 91.95%     | 1.67%     | 1.27%    | 1.13%      | 0.90%     | 1.09%    | 1.99%        |
| Aa             | 4.54%      | 79.41%    | 3.64%    | 2.34%      | 1.77%     | 2.50%    | 5.80%        |
| A              | 1.00%      | 2.90%     | 78.12%   | 4.87%      | 2.81%     | 2.94%    | 7.35%        |
| Baa            | 0.34%      | 0.43%     | 2.16%    | 75.81%     | 4.68%     | 4.42%    | 12.18%       |
| Ba             | 0.13%      | 0.06%     | 0.35%    | 2.21%      | 70.85%    | 4.83%    | 21.57%       |
| B              | 0.05%      | 0.03%     | 0.05%    | 0.22%      | 1.24%     | 59.41%   | 39.00%       |
| Caa-C          | 0.01%      | 0.00%     | 0.00%    | 0.03%      | 0.04%     | 0.22%    | 99.69%       |
| <b>3-year</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
| Aaa            | 92.63%     | 1.75%     | 1.24%    | 1.13%      | 0.82%     | 0.91%    | 1.52%        |
| Aa             | 15.48%     | 68.55%    | 4.54%    | 2.69%      | 1.64%     | 1.26%    | 5.84%        |
| A              | 4.82%      | 7.74%     | 68.44%   | 5.47%      | 3.14%     | 1.72%    | 8.66%        |
| Baa            | 1.95%      | 2.02%     | 6.34%    | 62.49%     | 6.03%     | 4.48%    | 16.70%       |
| Ba             | 0.64%      | 0.51%     | 2.04%    | 6.54%      | 62.98%    | 5.74%    | 21.55%       |
| B              | 0.22%      | 0.17%     | 0.40%    | 1.27%      | 4.94%     | 67.59%   | 25.41%       |
| Caa-C          | 0.12%      | 0.00%     | 0.04%    | 0.29%      | 0.30%     | 1.20%    | 98.05%       |
| <b>5-year</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
| Aaa            | 96.78%     | 1.29%     | 0.85%    | 0.44%      | 0.19%     | 0.21%    | 0.24%        |
| Aa             | 25.15%     | 64.93%    | 3.96%    | 2.37%      | 0.91%     | 0.87%    | 1.80%        |
| A              | 8.83%      | 10.01%    | 68.87%   | 4.94%      | 2.61%     | 1.22%    | 3.52%        |
| Baa            | 4.53%      | 3.82%     | 9.30%    | 60.38%     | 5.82%     | 3.85%    | 12.31%       |
| Ba             | 1.21%      | 1.07%     | 3.88%    | 9.71%      | 58.59%    | 6.12%    | 19.42%       |
| B              | 0.38%      | 0.17%     | 0.69%    | 2.55%      | 6.13%     | 56.13%   | 33.96%       |
| Caa-C          | 0.08%      | 0.00%     | 0.03%    | 0.37%      | 0.37%     | 1.38%    | 97.78%       |
| <b>7-year</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
| Aaa            | 97.53%     | 0.92%     | 0.66%    | 0.33%      | 0.15%     | 0.19%    | 0.22%        |
| Aa             | 28.83%     | 62.38%    | 3.43%    | 2.09%      | 0.64%     | 0.82%    | 1.82%        |
| A              | 10.73%     | 9.10%     | 70.32%   | 3.86%      | 1.64%     | 0.95%    | 3.39%        |
| Baa            | 7.11%      | 4.65%     | 9.53%    | 56.58%     | 4.26%     | 3.56%    | 14.31%       |
| Ba             | 1.52%      | 1.49%     | 5.06%    | 9.93%      | 52.21%    | 5.38%    | 24.41%       |
| B              | 0.45%      | 0.04%     | 0.88%    | 3.72%      | 4.71%     | 51.29%   | 38.92%       |
| Caa-C          | 0.00%      | 0.00%     | 0.02%    | 0.06%      | 0.51%     | 1.06%    | 98.35%       |
| <b>10-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
| Aaa            | 98.04%     | 0.87%     | 0.60%    | 0.22%      | 0.08%     | 0.08%    | 0.10%        |
| Aa             | 34.13%     | 59.64%    | 3.25%    | 1.14%      | 0.19%     | 0.44%    | 1.21%        |
| A              | 11.50%     | 9.09%     | 73.81%   | 2.01%      | 0.50%     | 0.68%    | 2.42%        |
| Baa            | 9.86%      | 4.51%     | 9.86%    | 53.84%     | 2.89%     | 3.08%    | 15.95%       |
| Ba             | 2.61%      | 2.63%     | 8.05%    | 13.27%     | 47.73%    | 3.06%    | 22.65%       |
| B              | 0.65%      | 0.07%     | 2.24%    | 6.39%      | 3.75%     | 53.37%   | 33.53%       |
| Caa-C          | 0.00%      | 0.00%     | 0.05%    | 0.00%      | 1.58%     | 2.41%    | 95.96%       |

**Figure 46 - Global Structured Finance excl SF CDOs, Other SF, and '05-'07 vintage US HEL & RMBS Rating Transition Matrices by Cohort Rating using Rating before WR (1984-2009)**

| 1-year  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  |
|---------|--------|--------|--------|--------|--------|--------|--------|
| Aaa     | 97.41% | 1.21%  | 0.72%  | 0.38%  | 0.14%  | 0.09%  | 0.06%  |
| Aa      | 6.02%  | 87.29% | 3.28%  | 1.65%  | 0.59%  | 0.50%  | 0.67%  |
| A       | 1.26%  | 3.58%  | 86.30% | 4.31%  | 2.11%  | 1.00%  | 1.43%  |
| Baa     | 0.42%  | 0.53%  | 2.78%  | 85.25% | 4.53%  | 3.26%  | 3.22%  |
| Ba      | 0.17%  | 0.08%  | 0.46%  | 2.81%  | 82.18% | 4.80%  | 9.50%  |
| B       | 0.06%  | 0.04%  | 0.08%  | 0.32%  | 1.75%  | 81.64% | 16.10% |
| Caa-C   | 0.03%  | 0.00%  | 0.00%  | 0.06%  | 0.06%  | 0.44%  | 99.41% |
| 3-year  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  |
| Aaa     | 96.68% | 1.41%  | 0.91%  | 0.51%  | 0.18%  | 0.19%  | 0.11%  |
| Aa      | 17.62% | 73.61% | 4.06%  | 2.25%  | 0.84%  | 0.58%  | 1.05%  |
| A       | 5.44%  | 8.54%  | 74.42% | 5.21%  | 2.74%  | 1.19%  | 2.47%  |
| Baa     | 2.25%  | 2.29%  | 7.28%  | 69.44% | 6.33%  | 4.44%  | 7.98%  |
| Ba      | 0.73%  | 0.59%  | 2.32%  | 7.24%  | 68.27% | 6.12%  | 14.73% |
| B       | 0.23%  | 0.17%  | 0.42%  | 1.31%  | 5.03%  | 68.41% | 24.44% |
| Caa-C   | 0.13%  | 0.00%  | 0.04%  | 0.24%  | 0.22%  | 1.17%  | 98.20% |
| 5-year  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  |
| Aaa     | 97.09% | 1.22%  | 0.81%  | 0.41%  | 0.16%  | 0.18%  | 0.13%  |
| Aa      | 25.60% | 65.19% | 3.91%  | 2.35%  | 0.82%  | 0.79%  | 1.33%  |
| A       | 8.96%  | 9.98%  | 69.24% | 4.91%  | 2.60%  | 1.22%  | 3.09%  |
| Baa     | 4.65%  | 3.89%  | 9.48%  | 61.06% | 5.89%  | 3.88%  | 11.14% |
| Ba      | 1.26%  | 1.10%  | 4.00%  | 9.85%  | 58.60% | 6.09%  | 19.09% |
| B       | 0.38%  | 0.17%  | 0.70%  | 2.57%  | 6.05%  | 56.35% | 33.78% |
| Caa-C   | 0.08%  | 0.00%  | 0.03%  | 0.32%  | 0.36%  | 1.36%  | 97.85% |
| 7-year  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  |
| Aaa     | 97.67% | 0.87%  | 0.65%  | 0.32%  | 0.14%  | 0.17%  | 0.18%  |
| Aa      | 29.06% | 62.40% | 3.39%  | 2.10%  | 0.60%  | 0.79%  | 1.65%  |
| A       | 10.81% | 9.08%  | 70.50% | 3.79%  | 1.64%  | 0.96%  | 3.22%  |
| Baa     | 7.23%  | 4.72%  | 9.65%  | 56.97% | 4.27%  | 3.58%  | 13.58% |
| Ba      | 1.55%  | 1.52%  | 5.11%  | 10.08% | 51.94% | 5.34%  | 24.46% |
| B       | 0.45%  | 0.04%  | 0.89%  | 3.73%  | 4.59%  | 51.35% | 38.95% |
| Caa-C   | 0.00%  | 0.00%  | 0.02%  | 0.06%  | 0.51%  | 1.06%  | 98.35% |
| 10-year | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  |
| Aaa     | 98.07% | 0.84%  | 0.60%  | 0.22%  | 0.08%  | 0.08%  | 0.10%  |
| Aa      | 34.21% | 59.61% | 3.19%  | 1.15%  | 0.19%  | 0.44%  | 1.22%  |
| A       | 11.55% | 9.09%  | 73.74% | 2.01%  | 0.50%  | 0.69%  | 2.43%  |
| Baa     | 9.89%  | 4.52%  | 9.88%  | 53.75% | 2.90%  | 3.09%  | 15.97% |
| Ba      | 2.62%  | 2.64%  | 8.08%  | 13.35% | 47.44% | 3.08%  | 22.79% |
| B       | 0.66%  | 0.07%  | 2.25%  | 6.41%  | 3.71%  | 53.37% | 33.54% |
| Caa-C   | 0.00%  | 0.00%  | 0.05%  | 0.00%  | 1.58%  | 2.41%  | 95.96% |







**Figure 49 - US RMBS Rating Transition Matrices by Cohort Rating using Rating before WR (1984-2009)**

| <b>1-year</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
|----------------|------------|-----------|----------|------------|-----------|----------|--------------|
| Aaa            | 90.17%     | 1.38%     | 1.28%    | 1.32%      | 1.18%     | 1.61%    | 3.07%        |
| Aa             | 5.67%      | 78.35%    | 2.14%    | 1.88%      | 1.81%     | 2.96%    | 7.19%        |
| A              | 1.03%      | 3.52%     | 70.82%   | 3.35%      | 2.52%     | 4.91%    | 13.85%       |
| Baa            | 0.32%      | 0.46%     | 2.97%    | 70.28%     | 2.75%     | 3.91%    | 19.31%       |
| Ba             | 0.08%      | 0.09%     | 0.77%    | 3.64%      | 67.61%    | 2.52%    | 25.28%       |
| B              | 0.00%      | 0.03%     | 0.07%    | 0.28%      | 2.39%     | 51.98%   | 45.26%       |
| Caa-C          | 0.00%      | 0.00%     | 0.01%    | 0.00%      | 0.04%     | 0.00%    | 99.96%       |
| <b>3-year</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
| Aaa            | 91.79%     | 1.43%     | 1.12%    | 1.33%      | 1.10%     | 1.27%    | 1.97%        |
| Aa             | 19.82%     | 67.29%    | 2.83%    | 1.90%      | 1.42%     | 0.97%    | 5.78%        |
| A              | 6.03%      | 10.71%    | 62.23%   | 3.07%      | 2.35%     | 1.98%    | 13.63%       |
| Baa            | 1.70%      | 2.71%     | 9.03%    | 63.03%     | 2.40%     | 2.22%    | 18.91%       |
| Ba             | 0.56%      | 0.39%     | 4.98%    | 10.93%     | 66.06%    | 2.46%    | 14.62%       |
| B              | 0.20%      | 0.17%     | 0.30%    | 1.88%      | 10.45%    | 73.27%   | 13.72%       |
| Caa-C          | 0.00%      | 0.00%     | 0.04%    | 0.00%      | 0.63%     | 0.00%    | 99.33%       |
| <b>5-year</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
| Aaa            | 98.46%     | 0.82%     | 0.51%    | 0.15%      | 0.02%     | 0.02%    | 0.00%        |
| Aa             | 31.62%     | 63.69%    | 2.56%    | 1.12%      | 0.37%     | 0.34%    | 0.30%        |
| A              | 12.85%     | 14.95%    | 63.95%   | 2.94%      | 1.68%     | 1.07%    | 2.55%        |
| Baa            | 4.08%      | 5.05%     | 12.67%   | 68.81%     | 2.12%     | 2.03%    | 5.24%        |
| Ba             | 1.13%      | 0.93%     | 8.79%    | 13.38%     | 64.71%    | 2.70%    | 8.36%        |
| B              | 0.54%      | 0.17%     | 0.21%    | 3.75%      | 10.57%    | 71.91%   | 12.84%       |
| Caa-C          | 0.00%      | 0.00%     | 0.04%    | 0.00%      | 0.89%     | 0.00%    | 99.06%       |
| <b>7-year</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
| Aaa            | 99.37%     | 0.26%     | 0.23%    | 0.11%      | 0.01%     | 0.02%    | 0.00%        |
| Aa             | 35.11%     | 61.08%    | 2.28%    | 0.66%      | 0.19%     | 0.29%    | 0.38%        |
| A              | 15.48%     | 14.35%    | 64.60%   | 2.25%      | 0.78%     | 0.56%    | 1.97%        |
| Baa            | 5.67%      | 4.74%     | 12.39%   | 70.06%     | 1.32%     | 1.80%    | 4.02%        |
| Ba             | 1.29%      | 1.64%     | 8.92%    | 13.02%     | 65.57%    | 2.23%    | 7.33%        |
| B              | 0.59%      | 0.05%     | 0.29%    | 4.98%      | 4.37%     | 78.15%   | 11.57%       |
| Caa-C          | 0.00%      | 0.00%     | 0.06%    | 0.00%      | 1.16%     | 0.00%    | 98.78%       |
| <b>10-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
| Aaa            | 99.30%     | 0.31%     | 0.27%    | 0.10%      | 0.00%     | 0.00%    | 0.01%        |
| Aa             | 39.48%     | 56.33%    | 2.73%    | 0.59%      | 0.13%     | 0.18%    | 0.56%        |
| A              | 19.84%     | 17.55%    | 56.23%   | 2.54%      | 0.71%     | 0.59%    | 2.53%        |
| Baa            | 7.38%      | 5.12%     | 15.25%   | 63.91%     | 1.34%     | 1.78%    | 5.23%        |
| Ba             | 1.71%      | 2.56%     | 10.63%   | 16.40%     | 56.83%    | 2.72%    | 9.16%        |
| B              | 0.50%      | 0.09%     | 0.62%    | 6.78%      | 2.11%     | 75.49%   | 14.42%       |
| Caa-C          | 0.00%      | 0.00%     | 0.10%    | 0.00%      | 1.98%     | 0.00%    | 97.92%       |

**Figure 50 - US CMBS Rating Transition Matrices by Cohort Rating using Rating before WR (1987-2009)**

| <b>1-year</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
|----------------|------------|-----------|----------|------------|-----------|----------|--------------|
| Aaa            | 97.80%     | 0.97%     | 0.75%    | 0.22%      | 0.18%     | 0.05%    | 0.03%        |
| Aa             | 14.98%     | 77.00%    | 4.03%    | 2.29%      | 0.75%     | 0.70%    | 0.24%        |
| A              | 3.81%      | 8.81%     | 78.22%   | 4.49%      | 2.68%     | 0.95%    | 1.03%        |
| Baa            | 0.97%      | 1.16%     | 5.95%    | 82.34%     | 4.47%     | 3.16%    | 1.95%        |
| Ba             | 0.21%      | 0.02%     | 0.45%    | 2.81%      | 86.42%    | 3.80%    | 6.30%        |
| B              | 0.11%      | 0.02%     | 0.02%    | 0.17%      | 0.95%     | 86.58%   | 12.15%       |
| Caa-C          | 0.06%      | 0.00%     | 0.00%    | 0.00%      | 0.13%     | 0.81%    | 98.99%       |
| <b>3-year</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
| Aaa            | 98.32%     | 1.11%     | 0.33%    | 0.12%      | 0.05%     | 0.04%    | 0.05%        |
| Aa             | 41.71%     | 52.58%    | 3.23%    | 1.14%      | 0.69%     | 0.34%    | 0.32%        |
| A              | 20.39%     | 19.77%    | 53.12%   | 3.94%      | 1.82%     | 0.38%    | 0.58%        |
| Baa            | 6.94%      | 5.86%     | 15.57%   | 63.24%     | 4.74%     | 2.05%    | 1.61%        |
| Ba             | 1.08%      | 0.76%     | 2.39%    | 8.78%      | 75.28%    | 6.72%    | 5.00%        |
| B              | 0.29%      | 0.10%     | 0.36%    | 1.02%      | 2.99%     | 74.71%   | 20.53%       |
| Caa-C          | 0.10%      | 0.00%     | 0.00%    | 0.00%      | 0.38%     | 2.33%    | 97.20%       |
| <b>5-year</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
| Aaa            | 98.41%     | 1.21%     | 0.31%    | 0.02%      | 0.00%     | 0.05%    | 0.00%        |
| Aa             | 54.12%     | 41.73%    | 2.27%    | 0.56%      | 0.64%     | 0.16%    | 0.52%        |
| A              | 36.94%     | 21.82%    | 36.45%   | 3.14%      | 1.33%     | 0.13%    | 0.19%        |
| Baa            | 15.71%     | 9.85%     | 19.70%   | 47.89%     | 4.49%     | 1.14%    | 1.21%        |
| Ba             | 2.24%      | 2.29%     | 4.64%    | 14.40%     | 61.94%    | 9.03%    | 5.46%        |
| B              | 0.29%      | 0.11%     | 0.98%    | 2.51%      | 4.65%     | 58.69%   | 32.77%       |
| Caa-C          | 0.20%      | 0.00%     | 0.00%    | 0.00%      | 0.73%     | 4.30%    | 94.78%       |
| <b>7-year</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
| Aaa            | 97.91%     | 1.19%     | 0.78%    | 0.08%      | 0.00%     | 0.02%    | 0.00%        |
| Aa             | 51.49%     | 43.40%    | 2.74%    | 0.83%      | 0.50%     | 0.25%    | 0.80%        |
| A              | 50.51%     | 15.17%    | 29.66%   | 2.60%      | 1.38%     | 0.13%    | 0.55%        |
| Baa            | 26.01%     | 12.47%    | 18.43%   | 35.38%     | 3.88%     | 1.50%    | 2.33%        |
| Ba             | 3.96%      | 4.36%     | 8.40%    | 18.40%     | 45.76%    | 9.13%    | 9.99%        |
| B              | 0.26%      | 0.00%     | 2.07%    | 4.59%      | 6.90%     | 43.97%   | 42.21%       |
| Caa-C          | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 1.67%     | 8.46%    | 89.87%       |
| <b>10-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
| Aaa            | 95.22%     | 1.89%     | 2.65%    | 0.24%      | 0.00%     | 0.00%    | 0.00%        |
| Aa             | 38.02%     | 55.29%    | 2.42%    | 2.19%      | 0.00%     | 0.50%    | 1.59%        |
| A              | 47.89%     | 8.27%     | 40.18%   | 2.41%      | 0.48%     | 0.00%    | 0.76%        |
| Baa            | 46.20%     | 9.59%     | 9.41%    | 28.35%     | 1.21%     | 1.93%    | 3.31%        |
| Ba             | 8.62%      | 7.63%     | 11.92%   | 22.15%     | 29.73%    | 3.89%    | 16.06%       |
| B              | 0.33%      | 0.00%     | 8.24%    | 11.24%     | 10.06%    | 39.15%   | 30.98%       |
| Caa-C          | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 4.41%     | 19.54%   | 76.05%       |



Figure 52 - Global Structured Finance One-Year Refined-Rating Transition Matrix by Cohort Rating in 2009

|      | Total | Aaa    | Aa1    | Aa2    | Aa3    | A1     | A2     | A3     | Baa1   | Baa2   | Baa3   | Ba1    | Ba2    | Ba3    | B1     | B2     | B3     | Caa1   | Caa2   | Caa3   | Ca     | C      | WR    |
|------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|
| Aaa  | 37300 | 46.96% | 3.03%  | 3.88%  | 3.39%  | 3.43%  | 1.77%  | 1.91%  | 2.09%  | 1.78%  | 2.16%  | 2.45%  | 1.12%  | 1.45%  | 1.03%  | 0.99%  | 3.73%  | 4.20%  | 2.66%  | 1.44%  | 1.67%  | 0.19%  | 8.67% |
| Aa1  | 3199  | 0.84%  | 26.48% | 3.69%  | 4.72%  | 4.94%  | 3.81%  | 3.78%  | 2.94%  | 3.75%  | 3.72%  | 5.44%  | 2.94%  | 2.13%  | 2.34%  | 2.06%  | 3.50%  | 3.66%  | 3.03%  | 3.28%  | 7.91%  | 2.94%  | 2.09% |
| Aa2  | 5119  | 0.57%  | 0.12%  | 31.41% | 3.77%  | 5.90%  | 6.51%  | 5.92%  | 5.84%  | 5.24%  | 3.50%  | 4.20%  | 1.91%  | 2.58%  | 1.33%  | 1.86%  | 2.79%  | 2.99%  | 2.60%  | 1.70%  | 2.34%  | 2.73%  | 4.20% |
| Aa3  | 3652  | 0.49%  | 0.33%  | 0.19%  | 30.07% | 6.27%  | 3.37%  | 4.49%  | 3.70%  | 3.97%  | 4.33%  | 2.52%  | 2.55%  | 2.90%  | 4.11%  | 2.96%  | 5.15%  | 3.12%  | 5.20%  | 1.89%  | 2.93%  | 2.93%  | 6.54% |
| A1   | 2997  | 0.60%  | 0.13%  | 0.47%  | 1.53%  | 19.62% | 2.27%  | 2.60%  | 3.60%  | 4.14%  | 5.37%  | 6.01%  | 4.17%  | 4.64%  | 3.97%  | 3.37%  | 7.14%  | 6.24%  | 7.37%  | 4.24%  | 4.67%  | 3.64%  | 4.20% |
| A2   | 5650  | 0.60%  | 0.11%  | 0.37%  | 0.32%  | 0.44%  | 32.34% | 2.18%  | 4.42%  | 4.57%  | 7.06%  | 7.36%  | 4.16%  | 3.59%  | 2.78%  | 2.44%  | 4.09%  | 3.15%  | 4.74%  | 3.15%  | 4.53%  | 3.38%  | 4.21% |
| A3   | 2737  | 0.29%  | 0.07%  | 0.04%  | 0.11%  | 0.15%  | 0.37%  | 23.16% | 2.59%  | 4.57%  | 5.92%  | 5.04%  | 3.95%  | 4.09%  | 2.92%  | 3.73%  | 8.84%  | 5.88%  | 7.89%  | 3.40%  | 7.45%  | 6.47%  | 3.07% |
| Baa1 | 3606  | 0.17%  | 0.06%  | 0.19%  | 0.11%  | 0.06%  | 0.03%  | 0.17%  | 21.69% | 3.83%  | 5.41%  | 4.49%  | 4.52%  | 4.74%  | 4.91%  | 2.80%  | 9.96%  | 3.99%  | 11.40% | 2.94%  | 6.71%  | 6.57%  | 5.27% |
| Baa2 | 4722  | 0.13%  | 0.02%  | 0.08%  | 0.06%  | 0.23%  | 0.21%  | 0.23%  | 1.27%  | 25.96% | 2.63%  | 4.21%  | 3.81%  | 5.61%  | 7.60%  | 4.17%  | 6.67%  | 4.87%  | 6.01%  | 4.79%  | 8.15%  | 9.32%  | 3.94% |
| Baa3 | 3087  | 0.03%  | 0.10%  |        |        |        | 0.13%  | 0.32%  | 0.62%  | 0.23%  | 26.24% | 2.40%  | 3.08%  | 4.54%  | 4.37%  | 4.57%  | 8.81%  | 5.02%  | 8.88%  | 5.44%  | 10.14% | 10.66% | 4.44% |
| Ba1  | 2008  | 0.05%  |        |        |        | 0.05%  |        | 0.05%  |        | 0.15%  | 3.09%  | 22.31% | 1.10%  | 2.94%  | 3.69%  | 3.59%  | 3.78%  | 6.37%  | 8.76%  | 8.81%  | 15.49% | 16.78% | 2.99% |
| Ba2  | 2839  | 0.04%  |        |        |        |        | 0.11%  | 0.11%  | 0.04%  | 0.11%  | 0.11%  | 0.11%  | 18.92% | 1.16%  | 2.71%  | 4.44%  | 11.76% | 4.97%  | 10.07% | 10.25% | 17.19% | 16.20% | 1.83% |
| Ba3  | 1803  |        |        | 0.06%  |        |        |        |        |        |        |        | 0.06%  |        | 18.80% | 1.89%  | 2.50%  | 7.27%  | 4.16%  | 9.04%  | 10.43% | 20.80% | 22.85% | 2.16% |
| B1   | 1434  | 0.07%  |        |        |        |        |        |        | 0.07%  |        |        |        | 0.14%  | 0.07%  | 17.15% | 1.39%  | 4.39%  | 2.79%  | 6.62%  | 6.49%  | 18.48% | 39.40% | 2.93% |
| B2   | 1802  |        |        |        |        |        |        |        |        |        |        |        | 0.11%  | 0.06%  | 0.11%  | 15.70% | 2.05%  | 2.44%  | 4.44%  | 9.88%  | 18.81% | 43.73% | 2.66% |
| B3   | 2140  |        |        | 0.05%  |        | 0.05%  |        |        |        |        | 0.09%  |        | 0.14%  |        |        | 0.05%  | 15.14% | 2.06%  | 3.32%  | 7.62%  | 15.61% | 53.97% | 1.92% |
| Caa1 | 1168  |        |        |        |        |        |        |        | 0.17%  |        |        |        |        | 0.09%  | 0.09%  | 0.26%  | 0.09%  | 14.21% | 3.68%  | 7.53%  | 25.94% | 45.80% | 2.14% |
| Caa2 | 1242  |        |        |        |        |        |        |        | 0.08%  |        |        |        |        |        | 0.08%  | 0.08%  |        |        | 11.19% | 2.17%  | 18.12% | 66.75% | 1.53% |
| Caa3 | 1108  |        |        |        |        |        |        |        | 0.09%  |        | 0.09%  |        |        |        |        |        |        | 0.18%  |        | 11.73% | 23.92% | 59.57% | 4.42% |
| Ca   | 4219  |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        | 0.05%  | 21.47% | 74.47% | 4.01% |
| C    | 8696  |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        | 94.11% | 5.89% |

Figure 53 - Global Structured Finance excl SF CDOs, Other SF, and '05-'07 vintage US HEL &amp; RMBS One-Year Refined-Rating Transition Matrix by Cohort Rating in 2009

|      | Total | Aaa    | Aa1    | Aa2    | Aa3    | A1     | A2     | A3     | Baa1   | Baa2   | Baa3   | Ba1    | Ba2   | Ba3    | B1     | B2     | B3     | Caa1   | Caa2   | Caa3   | Ca     | C      | WR     |
|------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Aaa  | 23115 | 66.58% | 3.85%  | 4.78%  | 3.93%  | 3.16%  | 1.73%  | 1.69%  | 1.03%  | 0.66%  | 0.71%  | 0.72%  | 0.31% | 0.23%  | 0.27%  | 0.10%  | 0.26%  | 0.13%  | 0.13%  | 0.07%  | 0.10%  | 0.09%  | 9.47%  |
| Aa1  | 1379  | 1.74%  | 47.64% | 6.09%  | 7.25%  | 6.60%  | 5.37%  | 5.44%  | 2.25%  | 2.90%  | 2.03%  | 1.38%  | 1.09% | 0.65%  | 1.74%  | 0.94%  | 0.58%  | 0.58%  | 0.15%  | 0.36%  | 0.58%  | 0.15%  | 4.50%  |
| Aa2  | 3581  | 0.75%  | 0.14%  | 40.10% | 4.05%  | 6.87%  | 7.65%  | 7.79%  | 7.07%  | 5.95%  | 3.10%  | 2.88%  | 1.14% | 1.37%  | 0.84%  | 1.01%  | 0.70%  | 1.12%  | 0.45%  | 0.89%  | 0.61%  | 0.11%  | 5.42%  |
| Aa3  | 2070  | 0.82%  | 0.53%  | 0.29%  | 43.82% | 9.42%  | 4.25%  | 6.18%  | 4.49%  | 3.57%  | 4.69%  | 1.21%  | 1.26% | 1.01%  | 1.16%  | 2.32%  | 1.59%  | 0.58%  | 1.01%  | 0.53%  | 0.72%  | 0.14%  | 10.39% |
| A1   | 1297  | 1.39%  | 0.23%  | 1.00%  | 3.55%  | 40.71% | 3.62%  | 4.55%  | 4.93%  | 5.55%  | 7.32%  | 5.17%  | 2.54% | 2.08%  | 0.69%  | 3.01%  | 1.54%  | 1.00%  | 1.31%  | 0.77%  | 1.23%  | 0.46%  | 7.32%  |
| A2   | 4228  | 0.80%  | 0.14%  | 0.33%  | 0.43%  | 0.59%  | 41.60% | 2.77%  | 5.25%  | 5.49%  | 8.30%  | 8.54%  | 4.85% | 3.31%  | 1.96%  | 1.47%  | 2.34%  | 1.23%  | 1.18%  | 1.73%  | 1.99%  | 0.50%  | 5.20%  |
| A3   | 1555  | 0.39%  | 0.13%  | 0.06%  | 0.13%  | 0.19%  | 0.64%  | 38.84% | 4.12%  | 7.27%  | 8.49%  | 6.24%  | 4.95% | 4.12%  | 2.38%  | 2.77%  | 3.73%  | 1.99%  | 1.93%  | 2.57%  | 3.02%  | 1.48%  | 4.57%  |
| Baa1 | 2052  | 0.10%  | 0.10%  | 0.34%  | 0.19%  | 0.10%  | 0.05%  | 0.29%  | 35.77% | 6.19%  | 8.38%  | 5.46%  | 4.92% | 4.63%  | 4.00%  | 2.10%  | 5.95%  | 2.24%  | 3.31%  | 2.29%  | 3.12%  | 1.75%  | 8.72%  |
| Baa2 | 3419  | 0.09%  | 0.03%  | 0.12%  | 0.09%  | 0.32%  | 0.29%  | 0.29%  | 1.75%  | 34.28% | 3.33%  | 5.21%  | 4.59% | 6.52%  | 8.66%  | 4.77%  | 4.83%  | 3.57%  | 4.04%  | 4.09%  | 5.41%  | 2.84%  | 4.88%  |
| Baa3 | 2064  | 0.05%  | 0.15%  |        |        |        | 0.15%  | 0.48%  | 0.92%  | 0.34%  | 37.26% | 3.25%  | 4.12% | 5.91%  | 5.28%  | 5.23%  | 8.48%  | 3.59%  | 4.51%  | 5.14%  | 5.62%  | 3.59%  | 5.96%  |
| Ba1  | 1089  | 0.09%  |        |        |        | 0.09%  |        | 0.09%  |        | 0.28%  | 5.69%  | 37.01% | 1.84% | 3.58%  | 5.14%  | 4.78%  | 3.31%  | 6.43%  | 6.06%  | 5.60%  | 9.09%  | 5.88%  | 5.05%  |
| Ba2  | 1768  | 0.06%  |        |        |        |        | 0.17%  | 0.11%  | 0.06%  | 0.17%  | 0.17%  | 28.85% | 1.53% | 3.68%  | 4.81%  | 6.05%  | 5.15%  | 9.95%  | 12.90% | 14.65% | 9.11%  |        | 2.60%  |
| Ba3  | 938   |        |        | 0.11%  |        |        |        |        |        |        |        |        |       | 33.16% | 2.88%  | 2.56%  | 4.80%  | 5.76%  | 9.81%  | 13.75% | 14.61% | 9.49%  | 3.09%  |
| B1   | 632   | 0.16%  |        |        |        |        |        |        | 0.16%  |        |        |        | 0.32% | 0.16%  | 34.49% | 2.69%  | 6.80%  | 3.64%  | 8.86%  | 9.02%  | 16.46% | 12.03% | 5.22%  |
| B2   | 756   |        |        |        |        |        |        |        |        |        |        |        | 0.26% | 0.13%  | 0.26%  | 32.94% | 2.25%  | 4.50%  | 5.16%  | 16.27% | 20.90% | 12.96% | 4.37%  |
| B3   | 749   |        |        | 0.13%  |        | 0.13%  |        |        |        |        | 0.27%  |        | 0.40% |        |        | 0.13%  | 36.32% | 4.41%  | 5.87%  | 14.42% | 17.22% | 16.82% | 3.87%  |
| Caa1 | 396   |        |        |        |        |        |        |        | 0.51%  |        |        |        |       | 0.25%  | 0.25%  | 0.76%  | 0.25%  | 35.10% | 2.78%  | 8.33%  | 27.53% | 19.44% | 4.80%  |
| Caa2 | 303   |        |        |        |        |        |        |        | 0.33%  |        |        |        |       |        | 0.33%  | 0.33%  |        | 32.01% | 3.96%  | 28.71% | 30.36% |        | 3.96%  |
| Caa3 | 287   |        |        |        |        |        |        |        | 0.35%  |        | 0.35%  |        |       |        |        |        |        | 0.70%  |        | 32.06% | 30.31% | 32.75% | 3.48%  |
| Ca   | 617   |        |        |        |        |        |        |        |        |        |        |        |       |        |        |        |        |        |        | 0.32%  | 61.59% | 33.23% | 4.86%  |
| C    | 599   |        |        |        |        |        |        |        |        |        |        |        |       |        |        |        |        |        |        |        |        | 82.47% | 17.53% |

Figure 54 - US ABS ex HEL One-Year Refined-Rating Transition Matrix by Cohort Rating in 2009

|      | Total | Aaa    | Aa1    | Aa2    | Aa3    | A1     | A2     | A3     | Baa1   | Baa2   | Baa3   | Ba1    | Ba2    | Ba3    | B1     | B2     | B3     | Caa1   | Caa2   | Caa3   | Ca     | C      | WR     |
|------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Aaa  | 3411  | 79.77% | 2.70%  | 0.73%  | 1.44%  | 0.15%  | 0.18%  | 4.08%  | 0.32%  | 0.03%  | 0.64%  | 0.26%  | 0.79%  | 0.41%  |        |        | 0.06%  |        | 0.35%  |        |        |        | 8.09%  |
| Aa1  | 176   | 4.55%  | 77.27% |        | 1.70%  | 0.57%  | 2.27%  | 5.11%  | 1.14%  | 1.14%  |        | 1.14%  |        |        |        |        |        |        |        |        |        |        | 5.11%  |
| Aa2  | 261   | 3.83%  |        | 59.77% | 8.43%  | 2.68%  | 1.53%  | 4.98%  | 3.83%  | 1.92%  | 0.38%  | 0.38%  | 0.77%  | 1.92%  |        | 0.38%  |        |        |        |        |        |        | 9.20%  |
| Aa3  | 627   | 1.75%  | 0.48%  | 0.32%  | 32.85% | 9.41%  | 3.83%  | 7.81%  | 2.55%  | 2.87%  | 6.86%  | 0.32%  | 0.80%  | 0.48%  | 1.59%  | 5.10%  | 1.91%  | 0.64%  | 1.44%  |        |        |        | 18.98% |
| A1   | 241   | 4.15%  | 0.41%  | 2.49%  | 16.18% | 32.78% | 6.64%  | 1.66%  | 1.66%  | 1.24%  | 10.79% | 0.83%  | 3.32%  | 1.66%  |        | 6.64%  | 0.41%  |        |        |        |        |        | 9.13%  |
| A2   | 891   | 1.91%  | 0.11%  | 0.90%  | 1.68%  | 1.23%  | 59.03% | 2.36%  | 7.18%  | 2.69%  | 2.02%  | 1.35%  | 0.67%  | 1.23%  | 0.56%  | 0.34%  | 1.46%  | 1.23%  | 0.56%  | 2.47%  | 1.57%  | 0.22%  | 9.20%  |
| A3   | 177   | 1.69%  | 0.56%  |        |        | 0.56%  | 0.56%  | 66.10% | 4.52%  | 1.13%  | 4.52%  | 1.69%  | 1.69%  | 2.82%  | 5.08%  | 0.56%  | 2.26%  |        |        |        |        |        | 6.21%  |
| Baa1 | 430   | 0.23%  | 0.47%  | 0.93%  | 0.70%  |        |        | 0.47%  | 36.98% | 10.00% | 10.70% | 2.56%  | 2.09%  | 1.40%  | 1.16%  | 3.02%  | 0.93%  | 0.93%  | 2.79%  | 0.23%  |        |        | 24.42% |
| Baa2 | 360   | 0.56%  |        | 0.28%  | 0.28%  | 0.83%  | 0.83%  | 0.83%  | 5.83%  | 59.72% | 2.22%  | 5.00%  | 2.50%  | 3.33%  | 1.67%  | 2.22%  | 0.83%  | 0.83%  | 0.28%  | 0.56%  | 0.83%  | 0.56%  | 10.00% |
| Baa3 | 353   |        | 0.85%  |        |        |        |        | 0.57%  |        |        | 69.12% | 1.42%  | 1.70%  | 2.55%  | 2.27%  | 1.42%  | 9.35%  |        | 0.57%  | 0.28%  |        |        | 9.92%  |
| Ba1  | 114   |        |        |        |        |        |        |        |        |        | 51.75% | 23.68% | 1.75%  |        | 1.75%  | 2.63%  | 1.75%  | 2.63%  |        |        | 2.63%  | 1.75%  | 9.65%  |
| Ba2  | 95    |        |        |        |        |        |        | 3.16%  |        |        |        |        | 53.68% | 2.11%  | 4.21%  | 6.32%  | 6.32%  | 6.32%  | 1.05%  | 2.11%  | 1.05%  | 6.32%  | 7.37%  |
| Ba3  | 41    |        |        |        |        |        |        |        |        |        |        |        |        | 63.41% | 4.88%  |        | 14.63% | 2.44%  |        | 4.88%  |        | 2.44%  | 7.32%  |
| B1   | 51    |        |        |        |        |        |        |        |        |        |        |        | 1.96%  | 33.33% | 5.88%  | 17.65% | 3.92%  | 3.92%  | 19.61% | 5.88%  | 7.84%  |        |        |
| B2   | 44    |        |        |        |        |        |        |        |        |        |        |        |        |        | 52.27% |        | 4.55%  | 6.82%  | 18.18% | 11.36% | 6.82%  |        |        |
| B3   | 68    |        |        |        |        |        |        |        |        |        |        | 1.47%  |        |        |        |        | 57.35% | 5.88%  | 8.82%  | 11.76% | 5.88%  | 5.88%  | 2.94%  |
| Caa1 | 60    |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        | 56.67% | 3.33%  |        | 23.33% | 16.67% |        |
| Caa2 | 30    |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        | 66.67% | 10.00% | 10.00% | 10.00% | 3.33%  |
| Caa3 | 29    |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        | 41.38% | 27.59% | 24.14% | 6.90%  |
| Ca   | 91    |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        | 83.52% | 14.29% | 2.20%  |
| C    | 213   |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        | 68.08% | 31.92% |



Figure 55 - US HEL One-Year Refined-Rating Transition Matrix by Cohort Rating in 2009

|      | Total | Aaa    | Aa1    | Aa2    | Aa3    | A1     | A2     | A3     | Baa1   | Baa2   | Baa3   | Ba1    | Ba2    | Ba3    | B1     | B2     | B3     | Caa1   | Caa2   | Caa3   | Ca     | C      | WR    |
|------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|
| Aaa  | 4335  | 62.35% | 1.85%  | 4.66%  | 3.64%  | 3.21%  | 2.77%  | 1.29%  | 1.38%  | 2.70%  | 1.27%  | 1.38%  | 1.48%  | 2.24%  | 0.74%  | 0.76%  | 1.48%  | 0.39%  | 0.55%  | 0.30%  | 0.21%  | 0.07%  | 5.28% |
| Aa1  | 667   | 0.30%  | 45.73% | 3.15%  | 4.95%  | 6.90%  | 4.35%  | 2.40%  | 3.15%  | 3.00%  | 1.95%  | 3.00%  | 3.60%  | 3.90%  | 4.05%  | 3.30%  | 2.70%  | 0.60%  | 0.75%  | 0.30%  | 0.30%  | 1.35%  | 0.30% |
| Aa2  | 1263  | 0.40%  |        | 47.43% | 3.64%  | 7.60%  | 6.57%  | 4.04%  | 4.20%  | 3.72%  | 2.45%  | 2.22%  | 2.30%  | 4.28%  | 1.66%  | 1.98%  | 2.69%  | 0.24%  | 1.74%  | 0.32%  | 1.03%  | 1.19%  | 0.32% |
| Aa3  | 649   | 0.31%  | 0.31%  |        | 38.83% | 3.54%  | 6.16%  | 4.78%  | 4.16%  | 3.54%  | 4.62%  | 3.39%  | 3.54%  | 6.32%  | 4.31%  | 4.31%  | 4.01%  | 0.62%  | 2.93%  |        | 1.23%  | 2.16%  | 0.92% |
| A1   | 613   | 0.16%  |        |        |        | 22.19% | 2.12%  | 6.53%  | 6.20%  | 5.55%  | 6.20%  | 5.06%  | 5.06%  | 8.65%  | 6.36%  | 5.71%  | 6.53%  | 1.47%  | 7.01%  | 1.31%  | 0.82%  | 3.10%  |       |
| A2   | 1087  | 0.92%  |        | 0.18%  | 0.09%  |        | 37.44% | 0.92%  | 7.18%  | 8.10%  | 8.19%  | 4.42%  | 1.75%  | 3.31%  | 3.04%  | 3.13%  | 5.61%  | 1.56%  | 4.69%  | 2.39%  | 3.04%  | 3.59%  | 0.46% |
| A3   | 659   | 0.30%  |        |        |        |        |        | 24.73% | 2.58%  | 10.93% | 8.95%  | 5.92%  | 4.40%  | 4.10%  | 4.55%  | 4.86%  | 5.77%  | 3.95%  | 6.83%  | 2.28%  | 3.64%  | 6.07%  | 0.15% |
| Baa1 | 1279  | 0.39%  |        | 0.08%  |        |        |        |        | 18.37% | 3.60%  | 5.94%  | 4.85%  | 4.85%  | 4.69%  | 4.77%  | 3.13%  | 18.14% | 3.52%  | 13.06% | 2.11%  | 4.69%  | 7.35%  | 0.47% |
| Baa2 | 955   | 0.31%  |        | 0.21%  | 0.10%  | 0.10%  |        | 0.10%  |        | 25.24% | 3.87%  | 7.23%  | 4.08%  | 6.81%  | 3.87%  | 4.29%  | 8.17%  | 3.25%  | 7.75%  | 3.77%  | 5.86%  | 14.76% | 0.21% |
| Baa3 | 614   | 0.16%  |        |        |        |        | 0.16%  | 0.16%  |        |        | 22.80% | 3.75%  | 5.21%  | 4.56%  | 3.26%  | 6.19%  | 7.33%  | 4.56%  | 9.12%  | 4.56%  | 8.96%  | 18.57% | 0.65% |
| Ba1  | 559   |        |        |        |        |        |        | 0.18%  |        | 0.18%  |        | 17.35% | 1.43%  | 3.22%  | 4.29%  | 3.94%  | 6.98%  | 4.29%  | 10.91% | 4.29%  | 15.56% | 27.01% | 0.36% |
| Ba2  | 448   |        |        |        |        |        |        |        |        |        |        |        | 20.09% | 2.68%  | 3.79%  | 4.46%  | 5.80%  | 1.56%  | 10.27% | 4.02%  | 14.51% | 31.92% | 0.89% |
| Ba3  | 417   |        |        | 0.24%  |        |        |        |        |        |        |        |        |        | 14.63% | 1.68%  | 4.56%  | 5.04%  | 3.12%  | 9.35%  | 7.19%  | 14.39% | 39.81% |       |
| B1   | 381   |        |        |        |        |        |        |        |        |        |        |        |        | 16.80% | 1.05%  | 7.35%  | 2.36%  | 7.35%  | 3.15%  | 16.54% | 45.41% |        |       |
| B2   | 445   |        |        |        |        |        |        |        |        |        |        |        |        |        | 11.46% | 2.92%  | 2.70%  | 8.09%  | 6.52%  | 17.30% | 50.79% | 0.22%  |       |
| B3   | 531   |        |        |        |        |        |        |        |        |        |        |        |        |        |        | 18.83% | 2.45%  | 6.21%  | 6.21%  | 18.83% | 47.08% | 0.38%  |       |
| Caa1 | 401   |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        | 11.97% | 7.98%  | 12.22% | 33.17% | 34.16% | 0.50% |
| Caa2 | 738   |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        | 9.62%  | 1.22%  | 15.99% | 73.04% | 0.14% |
| Caa3 | 251   |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        | 20.72% | 15.14% | 64.14% |       |
| Ca   | 694   |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        | 23.63% | 76.22% | 0.14% |
| C    | 5559  |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        | 99.96% | 0.04% |



Figure 57 - US CMBS One-Year Refined-Rating Transition Matrix by Cohort Rating in 2009

|      | Total | Aaa    | Aa1    | Aa2    | Aa3    | A1     | A2     | A3     | Baa1   | Baa2   | Baa3  | Ba1    | Ba2    | Ba3    | B1     | B2     | B3     | Caa1   | Caa2   | Caa3   | Ca     | C      | WR     |
|------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Aaa  | 3676  | 81.77% | 1.03%  | 1.80%  | 1.82%  | 1.77%  | 1.36%  | 0.57%  | 0.49%  | 0.38%  | 0.49% | 0.65%  | 0.35%  | 0.33%  | 0.33%  | 0.05%  | 0.08%  |        | 0.08%  | 0.11%  | 0.11%  | 0.05%  | 6.37%  |
| Aa1  | 229   | 2.18%  | 41.05% | 6.55%  | 6.11%  | 9.17%  | 6.99%  | 6.99%  | 0.44%  | 1.75%  | 3.93% | 2.62%  | 1.75%  | 1.75%  | 3.49%  | 2.18%  | 0.44%  | 1.31%  |        |        |        |        | 1.31%  |
| Aa2  | 445   | 1.35%  | 0.45%  | 37.30% | 3.37%  | 6.07%  | 8.99%  | 10.56% | 7.64%  | 2.92%  | 1.57% | 3.15%  | 2.02%  | 2.70%  | 1.80%  | 3.37%  | 1.57%  | 1.12%  | 0.67%  | 0.45%  | 0.90%  | 0.45%  | 1.57%  |
| Aa3  | 292   | 0.34%  | 1.37%  | 1.03%  | 35.62% | 4.79%  | 6.16%  | 12.67% | 11.30% | 8.22%  | 2.40% | 0.68%  | 2.05%  | 1.03%  | 1.03%  | 2.40%  | 2.05%  | 1.71%  | 0.68%  | 0.34%  | 1.03%  | 0.34%  | 2.74%  |
| A1   | 262   | 1.15%  |        | 1.91%  | 0.76%  | 34.35% | 4.20%  | 6.11%  | 8.78%  | 8.40%  | 6.87% | 2.29%  | 1.91%  | 3.44%  | 1.15%  | 3.82%  | 3.05%  | 3.05%  | 3.44%  | 1.15%  | 0.76%  | 1.53%  | 1.91%  |
| A2   | 433   |        | 0.23%  | 0.46%  |        | 0.69%  | 37.41% | 4.39%  | 6.70%  | 9.24%  | 9.93% | 7.62%  | 3.46%  | 0.92%  | 1.85%  | 1.85%  | 2.77%  | 2.08%  | 2.54%  | 2.31%  | 2.08%  | 1.62%  | 1.85%  |
| A3   | 398   | 0.25%  |        | 0.25%  | 0.25%  | 0.50%  | 1.26%  | 34.17% | 5.53%  | 5.78%  | 9.55% | 9.30%  | 7.29%  | 4.02%  | 1.51%  | 3.02%  | 3.02%  | 2.51%  | 2.51%  | 2.76%  | 3.02%  | 1.26%  | 2.26%  |
| Baa1 | 417   |        |        | 0.24%  | 0.24%  | 0.24%  |        | 0.72%  | 35.97% | 4.32%  | 5.28% | 8.39%  | 8.63%  | 8.87%  | 6.24%  | 1.44%  | 3.12%  | 3.12%  | 2.64%  | 3.60%  | 2.16%  | 3.84%  | 0.96%  |
| Baa2 | 476   |        |        | 0.21%  |        |        | 0.42%  |        | 1.26%  | 37.82% | 6.30% | 4.62%  | 7.14%  | 4.62%  | 6.51%  | 11.13% | 2.31%  | 3.36%  | 2.73%  | 4.41%  | 1.47%  | 4.41%  | 1.26%  |
| Baa3 | 502   |        |        |        |        | 0.20%  |        |        | 1.00%  | 34.66% | 3.98% | 5.18%  | 10.16% | 4.38%  | 4.78%  | 14.54% | 3.98%  | 3.98%  | 5.38%  | 1.79%  | 4.58%  | 1.39%  |        |
| Ba1  | 365   |        |        |        |        |        |        |        |        |        | 0.55% | 44.38% | 2.19%  | 4.66%  | 7.40%  | 4.66%  | 3.29%  | 12.05% | 7.12%  | 4.66%  | 3.01%  | 4.93%  | 1.10%  |
| Ba2  | 403   | 0.25%  |        |        |        |        |        |        |        |        | 0.25% |        | 43.67% | 1.74%  | 2.73%  | 7.20%  | 4.47%  | 10.92% | 10.17% | 7.20%  | 4.47%  | 6.95%  |        |
| Ba3  | 357   |        |        |        |        |        |        |        |        |        |       |        |        | 44.26% | 3.64%  | 3.36%  | 5.60%  | 5.88%  | 14.57% | 9.80%  | 3.36%  | 8.40%  | 1.12%  |
| B1   | 278   |        |        |        |        |        |        |        |        |        |       |        |        |        | 45.32% | 3.24%  | 3.24%  | 5.04%  | 16.91% | 13.31% | 3.24%  | 8.27%  | 1.44%  |
| B2   | 320   |        |        |        |        |        |        |        |        |        |       |        | 0.63%  | 0.31%  |        | 41.56% | 4.06%  | 6.56%  | 6.56%  | 25.00% | 4.69%  | 9.06%  | 1.56%  |
| B3   | 296   |        |        |        |        |        |        |        |        |        |       |        |        |        |        | 0.34%  | 44.26% | 5.74%  | 3.38%  | 27.36% | 7.43%  | 9.80%  | 1.69%  |
| Caa1 | 82    |        |        |        |        |        |        |        |        |        |       |        |        | 1.22%  |        |        |        | 42.68% | 3.66%  | 19.51% | 14.63% | 12.20% | 6.10%  |
| Caa2 | 63    |        |        |        |        |        |        |        |        |        |       |        |        |        |        |        |        |        | 46.03% | 9.52%  | 23.81% | 19.05% | 1.59%  |
| Caa3 | 37    |        |        |        |        |        |        |        |        |        |       |        |        |        |        |        |        |        |        | 67.57% | 18.92% | 8.11%  | 5.41%  |
| Ca   | 32    |        |        |        |        |        |        |        |        |        |       |        |        |        |        |        |        |        |        |        | 71.88% | 9.38%  | 18.75% |
| C    | 34    |        |        |        |        |        |        |        |        |        |       |        |        |        |        |        |        |        |        |        |        | 85.29% | 14.71% |

Figure 58 - US CDO One-Year Refined-Rating Transition Matrix by Cohort Rating in 2009

|      | Total | Aaa    | Aa1    | Aa2    | Aa3    | A1     | A2     | A3     | Baa1   | Baa2  | Baa3   | Ba1    | Ba2    | Ba3    | B1     | B2    | B3    | Caa1  | Caa2   | Caa3   | Ca     | C      | WR     |        |
|------|-------|--------|--------|--------|--------|--------|--------|--------|--------|-------|--------|--------|--------|--------|--------|-------|-------|-------|--------|--------|--------|--------|--------|--------|
| Aaa  | 1863  | 33.12% | 11.38% | 12.18% | 11.06% | 8.27%  | 2.63%  | 3.27%  | 0.86%  | 0.59% | 1.02%  | 3.11%  | 0.86%  | 0.54%  | 0.81%  | 0.21% | 0.11% | 0.59% | 0.16%  | 0.16%  | 0.16%  |        | 8.91%  |        |
| Aa1  | 237   | 0.84%  | 11.81% | 7.17%  | 12.66% | 15.61% | 8.86%  | 7.17%  | 2.95%  | 3.80% | 1.27%  | 3.80%  | 2.95%  | 0.84%  | 5.06%  | 2.53% | 1.27% | 1.69% | 1.69%  | 1.27%  | 0.84%  |        | 5.91%  |        |
| Aa2  | 780   |        | 0.13%  | 7.44%  | 4.62%  | 11.41% | 15.38% | 14.23% | 10.90% | 7.69% | 3.21%  | 5.38%  | 1.67%  | 1.54%  | 1.67%  | 1.15% | 1.54% | 1.67% | 1.41%  | 3.33%  | 1.54%  | 0.26%  | 3.85%  |        |
| Aa3  | 223   | 0.90%  | 0.90%  | 0.45%  | 13.00% | 3.14%  | 2.24%  | 1.79%  | 3.14%  | 3.14% | 4.04%  | 5.83%  | 6.28%  | 4.04%  | 3.59%  | 3.14% | 4.48% | 5.38% | 5.83%  | 7.62%  | 7.62%  | 1.35%  | 12.11% |        |
| A1   | 190   |        |        | 0.53%  |        | 4.74%  | 2.11%  | 1.58%  | 3.16%  | 6.84% | 5.79%  | 12.11% | 3.16%  | 1.05%  | 3.68%  | 2.11% | 1.58% | 3.16% | 7.37%  | 8.42%  | 8.95%  | 3.16%  | 20.53% |        |
| A2   | 839   |        |        | 0.95%  |        | 0.83%  | 3.10%  | 2.15%  | 2.38%  | 4.17% | 20.26% | 25.74% | 12.16% | 5.84%  | 2.50%  | 2.62% | 2.50% | 0.95% | 2.03%  | 2.50%  | 4.53%  | 1.07%  | 3.69%  |        |
| A3   | 200   |        | 0.50%  |        | 0.50%  |        |        | 5.00%  | 1.00%  | 3.50% | 3.00%  | 6.00%  | 3.50%  | 2.50%  | 3.50%  | 6.50% | 2.50% | 7.00% | 2.50%  | 12.00% | 21.00% | 7.00%  | 12.50% |        |
| Baa1 | 176   |        |        |        |        |        |        |        | 5.11%  | 1.70% | 6.25%  | 2.27%  | 3.41%  | 4.55%  | 5.11%  | 0.57% | 2.27% | 3.41% | 9.66%  | 9.66%  | 28.41% | 6.82%  | 10.80% |        |
| Baa2 | 908   |        |        |        |        | 0.55%  | 0.11%  | 0.11%  | 0.66%  | 2.53% | 0.88%  | 3.30%  | 4.52%  | 12.67% | 21.81% | 5.51% | 7.27% | 5.51% | 6.94%  | 7.16%  | 11.34% | 4.19%  | 4.96%  |        |
| Baa3 | 307   |        |        |        |        |        | 0.33%  | 1.95%  | 0.33%  |       | 3.58%  | 0.98%  | 3.26%  | 6.51%  | 6.84%  | 7.17% | 4.89% | 4.89% | 8.14%  | 11.07% | 18.24% | 6.84%  | 14.98% |        |
| Ba1  | 166   |        |        |        |        | 0.60%  |        |        |        |       |        | 4.22%  |        | 3.01%  | 5.42%  | 4.82% | 2.41% | 1.81% | 9.64%  | 18.67% | 26.51% | 15.06% | 7.83%  |        |
| Ba2  | 625   |        |        |        |        |        |        |        |        | 0.16% |        |        | 2.08%  | 0.64%  | 3.04%  | 2.88% | 8.32% | 3.68% | 12.96% | 23.20% | 27.36% | 13.28% | 2.40%  |        |
| Ba3  | 150   |        |        |        |        |        |        |        |        |       |        |        |        | 2.67%  | 1.33%  | 0.67% | 4.00% | 1.33% | 7.33%  | 11.33% | 39.33% | 20.67% | 11.33% |        |
| B1   | 166   |        |        |        |        |        |        |        |        |       |        |        | 0.60%  |        | 3.61%  | 1.81% | 1.20% | 4.82% | 2.41%  | 5.42%  | 37.95% | 28.92% | 13.25% |        |
| B2   | 145   |        |        |        |        |        |        |        |        |       |        |        |        |        |        | 4.14% |       | 2.07% | 4.14%  | 6.21%  | 45.52% | 28.97% | 8.97%  |        |
| B3   | 151   |        |        |        |        |        |        |        |        | 1.32% |        | 1.32%  |        |        |        |       | 3.31% | 1.32% | 7.95%  | 9.27%  | 29.14% | 37.75% | 8.61%  |        |
| Caa1 | 148   |        |        |        |        |        |        |        |        |       |        |        |        |        |        | 2.03% |       | 2.70% |        | 8.11%  | 39.19% | 40.54% | 7.43%  |        |
| Caa2 | 112   |        |        |        |        |        |        |        |        |       |        |        |        |        |        | 0.89% | 0.89% |       | 0.89%  | 4.46%  | 43.75% | 42.86% | 6.25%  |        |
| Caa3 | 399   |        |        |        |        |        |        |        |        |       |        |        |        |        |        |       |       | 0.50% |        | 3.01%  | 20.80% | 69.42% | 6.27%  |        |
| Ca   | 1152  |        |        |        |        |        |        |        |        |       |        |        |        |        |        |       |       |       |        |        | 0.17%  | 40.97% | 47.74% | 11.11% |
| C    | 1648  |        |        |        |        |        |        |        |        |       |        |        |        |        |        |       |       |       |        |        |        | 74.64% | 25.36% |        |

Figure 59 - Global Structured Finance One-Year Refined-Rating Transition Matrix by Cohort Rating (1984-2009)

|      | Aaa    | Aa1    | Aa2    | Aa3    | A1     | A2     | A3     | Baa1   | Baa2   | Baa3   | Ba1    | Ba2    | Ba3    | B1     | B2     | B3     | Caa1   | Caa2   | Caa3   | Ca     | C      | WR     |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Aaa  | 79.91% | 0.44%  | 0.51%  | 0.69%  | 0.51%  | 0.40%  | 0.34%  | 0.42%  | 0.30%  | 0.40%  | 0.39%  | 0.23%  | 0.27%  | 0.23%  | 0.20%  | 0.66%  | 0.61%  | 0.53%  | 0.29%  | 0.44%  | 0.09%  | 12.14% |
| Aa1  | 6.38%  | 68.11% | 1.02%  | 1.01%  | 1.26%  | 0.92%  | 0.86%  | 0.64%  | 0.69%  | 0.77%  | 0.89%  | 0.69%  | 0.85%  | 0.89%  | 0.72%  | 0.98%  | 0.64%  | 0.74%  | 0.56%  | 2.90%  | 2.26%  | 6.22%  |
| Aa2  | 3.76%  | 1.35%  | 74.96% | 1.11%  | 1.20%  | 1.10%  | 0.90%  | 0.75%  | 0.65%  | 0.52%  | 0.56%  | 0.34%  | 0.43%  | 0.58%  | 0.59%  | 0.71%  | 0.41%  | 0.46%  | 0.38%  | 1.08%  | 1.81%  | 6.37%  |
| Aa3  | 2.45%  | 1.44%  | 1.66%  | 64.88% | 1.96%  | 1.46%  | 1.72%  | 1.32%  | 1.25%  | 1.03%  | 0.60%  | 0.61%  | 0.84%  | 1.03%  | 1.34%  | 1.53%  | 0.70%  | 1.34%  | 0.54%  | 1.80%  | 3.64%  | 6.85%  |
| A1   | 1.51%  | 0.75%  | 1.36%  | 2.19%  | 63.31% | 1.73%  | 1.84%  | 1.82%  | 2.32%  | 1.36%  | 0.88%  | 0.64%  | 0.69%  | 0.82%  | 1.22%  | 1.73%  | 1.23%  | 1.34%  | 0.72%  | 1.65%  | 3.06%  | 7.84%  |
| A2   | 0.71%  | 0.35%  | 1.26%  | 0.93%  | 1.19%  | 74.07% | 0.72%  | 1.21%  | 1.30%  | 1.60%  | 1.32%  | 0.64%  | 0.57%  | 0.49%  | 0.62%  | 1.16%  | 0.62%  | 0.72%  | 0.50%  | 1.49%  | 2.08%  | 6.45%  |
| A3   | 0.72%  | 0.27%  | 0.54%  | 1.12%  | 1.05%  | 1.26%  | 65.00% | 1.45%  | 2.34%  | 2.24%  | 1.67%  | 1.26%  | 1.04%  | 0.89%  | 1.10%  | 1.81%  | 1.21%  | 1.44%  | 1.17%  | 2.76%  | 4.39%  | 5.27%  |
| Baa1 | 0.39%  | 0.11%  | 0.18%  | 0.25%  | 0.85%  | 1.03%  | 1.10%  | 64.07% | 1.43%  | 2.36%  | 2.06%  | 1.56%  | 1.59%  | 1.39%  | 1.09%  | 2.08%  | 1.45%  | 2.04%  | 1.21%  | 3.28%  | 5.65%  | 4.83%  |
| Baa2 | 0.22%  | 0.05%  | 0.16%  | 0.18%  | 0.29%  | 1.08%  | 0.84%  | 1.21%  | 70.78% | 1.35%  | 1.63%  | 1.23%  | 1.47%  | 1.49%  | 1.02%  | 1.43%  | 0.83%  | 1.04%  | 0.97%  | 2.75%  | 4.18%  | 5.82%  |
| Baa3 | 0.24%  | 0.05%  | 0.09%  | 0.12%  | 0.21%  | 0.26%  | 0.61%  | 0.84%  | 1.09%  | 66.63% | 1.37%  | 1.48%  | 1.79%  | 1.56%  | 1.25%  | 2.21%  | 1.12%  | 1.44%  | 1.34%  | 3.90%  | 5.98%  | 6.42%  |
| Ba1  | 0.15%  | 0.02%  | 0.02%  | 0.02%  | 0.03%  | 0.16%  | 0.21%  | 0.40%  | 0.59%  | 2.10%  | 58.37% | 1.00%  | 1.57%  | 1.63%  | 1.42%  | 1.97%  | 1.82%  | 2.29%  | 2.11%  | 5.62%  | 12.47% | 6.02%  |
| Ba2  | 0.08%  | 0.01%  | 0.03%  | 0.03%  | 0.05%  | 0.07%  | 0.11%  | 0.24%  | 1.00%  | 0.74%  | 0.98%  | 67.94% | 0.72%  | 1.02%  | 1.27%  | 2.47%  | 1.40%  | 2.35%  | 1.96%  | 4.24%  | 7.77%  | 5.54%  |
| Ba3  | 0.09%  |        | 0.01%  | 0.02%  | 0.09%  | 0.13%  | 0.10%  | 0.09%  | 0.16%  | 0.84%  | 0.55%  | 0.74%  | 64.79% | 1.35%  | 1.18%  | 1.92%  | 1.97%  | 2.38%  | 2.32%  | 4.39%  | 10.46% | 6.41%  |
| B1   | 0.07%  |        |        | 0.03%  | 0.03%  |        | 0.03%  | 0.01%  | 0.15%  | 0.13%  | 0.15%  | 0.42%  | 0.37%  | 51.09% | 1.46%  | 2.62%  | 1.81%  | 2.72%  | 2.64%  | 5.75%  | 24.80% | 5.71%  |
| B2   | 0.03%  | 0.01%  |        |        | 0.02%  | 0.03%  | 0.01%  | 0.03%  | 0.03%  | 0.16%  | 0.22%  | 0.92%  | 0.62%  | 0.48%  | 62.05% | 1.41%  | 1.66%  | 1.75%  | 2.49%  | 4.42%  | 19.11% | 4.57%  |
| B3   | 0.02%  |        | 0.02%  |        | 0.03%  |        |        | 0.02%  |        | 0.06%  | 0.06%  | 0.12%  | 0.24%  | 0.19%  | 0.26%  | 46.96% | 2.12%  | 2.67%  | 3.28%  | 5.46%  | 33.23% | 5.23%  |
| Caa1 | 0.04%  |        |        |        |        | 0.01%  |        |        | 0.01%  | 0.07%  |        | 0.05%  | 0.09%  | 0.51%  | 0.05%  | 0.22%  | 38.40% | 1.78%  | 2.98%  | 8.59%  | 41.52% | 5.70%  |
| Caa2 | 0.05%  |        |        |        |        |        |        |        | 0.01%  |        | 0.09%  | 0.07%  |        |        | 0.08%  | 0.47%  | 1.07%  | 38.57% | 2.56%  | 9.29%  | 40.12% | 7.61%  |
| Caa3 |        |        |        |        |        |        |        | 0.02%  | 0.01%  | 0.05%  | 0.01%  |        |        | 0.14%  | 0.20%  | 0.11%  | 0.20%  | 0.06%  | 35.45% | 8.60%  | 44.88% | 10.28% |
| Ca   |        |        |        |        |        |        |        |        |        | 0.02%  |        |        |        | 0.01%  |        | 0.01%  | 0.03%  |        | 0.03%  | 39.64% | 49.78% | 10.48% |
| C    |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        | 0.03%  |        |        | 82.31% | 17.66% |

Figure 60 - Global Structured Finance excl SF CDOs, Other SF, and '05-'07 vintage US HEL & RMBS One-Year Refined-Rating Transition Matrix by Cohort Rating (1984-2009)

|      | Aaa    | Aa1    | Aa2    | Aa3    | A1     | A2     | A3     | Baa1   | Baa2   | Baa3   | Ba1    | Ba2    | Ba3    | B1     | B2     | B3     | Caa1   | Caa2   | Caa3   | Ca     | C      | WR     |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Aaa  | 83.44% | 0.32%  | 0.35%  | 0.50%  | 0.24%  | 0.27%  | 0.18%  | 0.17%  | 0.08%  | 0.12%  | 0.07%  | 0.03%  | 0.04%  | 0.03%  | 0.01%  | 0.04%  | 0.01%  | 0.01%  | 0.01%  | 0.01%  | 0.01%  | 14.07% |
| Aa1  | 10.11% | 74.86% | 0.93%  | 0.73%  | 1.00%  | 0.62%  | 0.48%  | 0.19%  | 0.22%  | 0.22%  | 0.14%  | 0.12%  | 0.12%  | 0.15%  | 0.08%  | 0.09%  | 0.07%  | 0.03%  | 0.05%  | 0.14%  | 0.02%  | 9.64%  |
| Aa2  | 4.56%  | 1.59%  | 79.49% | 1.10%  | 1.05%  | 0.92%  | 0.87%  | 0.61%  | 0.49%  | 0.35%  | 0.25%  | 0.14%  | 0.14%  | 0.12%  | 0.13%  | 0.11%  | 0.13%  | 0.07%  | 0.12%  | 0.19%  | 0.02%  | 7.57%  |
| Aa3  | 3.41%  | 1.88%  | 2.24%  | 71.63% | 2.16%  | 1.42%  | 1.77%  | 1.15%  | 1.18%  | 0.85%  | 0.24%  | 0.34%  | 0.35%  | 0.26%  | 0.43%  | 0.32%  | 0.23%  | 0.29%  | 0.18%  | 0.60%  | 0.06%  | 9.00%  |
| A1   | 2.08%  | 1.03%  | 1.73%  | 2.98%  | 71.22% | 1.49%  | 1.55%  | 1.47%  | 2.24%  | 1.18%  | 0.52%  | 0.31%  | 0.29%  | 0.13%  | 0.28%  | 0.24%  | 0.24%  | 0.16%  | 0.15%  | 0.36%  | 0.04%  | 10.33% |
| A2   | 0.84%  | 0.41%  | 1.47%  | 1.08%  | 1.42%  | 79.12% | 0.58%  | 0.96%  | 1.07%  | 1.50%  | 1.17%  | 0.47%  | 0.38%  | 0.24%  | 0.20%  | 0.43%  | 0.20%  | 0.20%  | 0.25%  | 0.48%  | 0.10%  | 7.43%  |
| A3   | 1.01%  | 0.35%  | 0.74%  | 1.51%  | 1.50%  | 1.78%  | 73.74% | 1.33%  | 2.40%  | 2.12%  | 1.55%  | 0.97%  | 0.67%  | 0.46%  | 0.44%  | 0.56%  | 0.36%  | 0.35%  | 0.47%  | 0.85%  | 0.25%  | 6.58%  |
| Baa1 | 0.55%  | 0.15%  | 0.26%  | 0.36%  | 1.21%  | 1.46%  | 1.57%  | 75.35% | 1.45%  | 2.43%  | 1.80%  | 1.33%  | 1.26%  | 1.03%  | 0.50%  | 0.60%  | 0.48%  | 0.55%  | 0.36%  | 0.68%  | 0.44%  | 6.17%  |
| Baa2 | 0.26%  | 0.06%  | 0.20%  | 0.21%  | 0.36%  | 1.35%  | 1.03%  | 1.50%  | 76.65% | 1.45%  | 1.59%  | 1.14%  | 1.51%  | 1.43%  | 0.78%  | 0.82%  | 0.46%  | 0.51%  | 0.57%  | 0.93%  | 0.49%  | 6.71%  |
| Baa3 | 0.30%  | 0.04%  | 0.12%  | 0.12%  | 0.28%  | 0.34%  | 0.80%  | 1.09%  | 1.41%  | 75.33% | 1.50%  | 1.47%  | 1.81%  | 1.55%  | 1.05%  | 1.65%  | 0.74%  | 0.65%  | 0.66%  | 1.20%  | 0.60%  | 7.29%  |
| Ba1  | 0.22%  | 0.03%  | 0.03%  | 0.03%  | 0.05%  | 0.24%  | 0.31%  | 0.60%  | 0.88%  | 3.11%  | 73.00% | 1.26%  | 1.74%  | 1.63%  | 1.44%  | 1.57%  | 1.64%  | 1.67%  | 0.99%  | 1.94%  | 1.34%  | 6.31%  |
| Ba2  | 0.10%  | 0.02%  | 0.04%  | 0.04%  | 0.06%  | 0.09%  | 0.14%  | 0.26%  | 1.20%  | 0.89%  | 1.21%  | 75.59% | 0.83%  | 1.05%  | 1.26%  | 2.38%  | 1.28%  | 2.19%  | 1.80%  | 2.17%  | 1.75%  | 5.66%  |
| Ba3  | 0.11%  |        | 0.01%  | 0.02%  | 0.11%  | 0.16%  | 0.13%  | 0.11%  | 0.20%  | 1.00%  | 0.68%  | 0.92%  | 74.70% | 1.57%  | 1.29%  | 1.98%  | 2.25%  | 2.38%  | 2.35%  | 2.34%  | 1.92%  | 5.77%  |
| B1   | 0.10%  |        |        | 0.04%  | 0.04%  | 0.01%  | 0.04%  | 0.02%  | 0.20%  | 0.18%  | 0.21%  | 0.59%  | 0.49%  | 71.16% | 2.02%  | 3.41%  | 2.26%  | 3.05%  | 3.05%  | 3.57%  | 3.43%  | 6.12%  |
| B2   | 0.04%  | 0.01%  |        |        | 0.02%  | 0.03%  | 0.01%  | 0.03%  | 0.05%  | 0.21%  | 0.29%  | 1.19%  | 0.84%  | 0.62%  | 77.37% | 1.77%  | 2.02%  | 2.02%  | 2.83%  | 3.17%  | 2.53%  | 4.94%  |
| B3   | 0.04%  |        | 0.03%  |        | 0.06%  |        |        | 0.03%  |        | 0.10%  | 0.10%  | 0.19%  | 0.38%  | 0.31%  | 0.41%  | 73.54% | 3.30%  | 3.87%  | 4.44%  | 4.59%  | 3.73%  | 4.88%  |
| Caa1 | 0.06%  |        |        |        |        | 0.01%  |        |        | 0.02%  | 0.12%  |        | 0.09%  | 0.16%  | 0.92%  | 0.09%  | 0.22%  | 67.58% | 2.66%  | 4.30%  | 9.83%  | 7.82%  | 6.12%  |
| Caa2 | 0.08%  |        |        |        |        |        |        |        | 0.01%  |        |        | 0.12%  |        |        | 0.15%  | 0.83%  | 1.88%  | 65.12% | 3.88%  | 10.52% | 9.60%  | 7.79%  |
| Caa3 |        |        |        |        |        |        |        | 0.03%  | 0.02%  | 0.09%  | 0.01%  |        |        | 0.27%  | 0.16%  | 0.21%  | 0.38%  | 0.11%  | 64.50% | 9.12%  | 13.64% | 11.46% |
| Ca   |        |        |        |        |        |        |        |        |        |        |        |        |        | 0.02%  |        | 0.02%  | 0.07%  |        | 0.07%  | 79.01% | 12.25% | 8.55%  |
| C    |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        | 86.97% | 13.03% |

Figure 61 - US ABS ex HEL One-Year Refined-Rating Transition Matrix by Cohort Rating (1984-2009)

|      | Aaa    | Aa1    | Aa2    | Aa3    | A1     | A2     | A3     | Baa1   | Baa2   | Baa3   | Ba1    | Ba2    | Ba3    | B1     | B2     | B3     | Caa1   | Caa2   | Caa3   | Ca     | C      | WR     |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Aaa  | 81.88% | 0.23%  | 0.20%  | 1.03%  | 0.16%  | 0.53%  | 0.45%  | 0.30%  | 0.10%  | 0.15%  | 0.05%  | 0.05%  | 0.08%  | 0.01%  |        | 0.09%  | 0.01%  | 0.02%  | 0.02%  |        |        | 14.65% |
| Aa1  | 2.91%  | 77.39% | 0.85%  | 1.18%  | 4.02%  | 1.57%  | 0.61%  | 0.23%  | 0.03%  | 0.14%  | 0.03%  | 0.04%  | 0.05%  | 0.33%  | 0.05%  | 0.03%  | 0.08%  | 0.01%  |        |        |        | 10.45% |
| Aa2  | 3.17%  | 0.86%  | 81.03% | 0.55%  | 0.67%  | 0.86%  | 0.97%  | 0.39%  | 0.50%  | 0.31%  | 0.20%  | 0.18%  | 0.12%  | 0.05%  | 0.01%  | 0.01%  | 0.01%  | 0.05%  | 0.04%  | 0.13%  | 0.06%  | 9.82%  |
| Aa3  | 1.51%  | 0.96%  | 0.61%  | 68.64% | 1.99%  | 1.51%  | 3.02%  | 1.12%  | 1.92%  | 1.57%  | 0.17%  | 0.46%  | 0.60%  | 0.56%  | 1.22%  | 0.34%  | 0.41%  | 0.30%  | 0.03%  | 1.17%  | 0.06%  | 11.83% |
| A1   | 1.16%  | 0.42%  | 0.85%  | 4.60%  | 69.47% | 0.57%  | 1.60%  | 1.93%  | 4.05%  | 1.29%  | 0.17%  | 0.34%  | 0.16%  | 0.05%  | 0.21%  | 0.10%  | 0.16%  | 0.01%  | 0.01%  | 0.07%  | 0.05%  | 12.72% |
| A2   | 0.57%  | 0.24%  | 0.37%  | 0.61%  | 1.40%  | 82.33% | 0.35%  | 0.74%  | 0.61%  | 0.61%  | 0.29%  | 0.23%  | 0.17%  | 0.17%  | 0.10%  | 0.42%  | 0.29%  | 0.08%  | 0.24%  | 0.12%  | 0.10%  | 9.97%  |
| A3   | 0.94%  | 0.34%  | 0.54%  | 0.70%  | 1.00%  | 1.07%  | 68.59% | 1.36%  | 3.86%  | 3.20%  | 1.93%  | 0.66%  | 0.67%  | 0.88%  | 0.56%  | 0.75%  | 0.20%  | 0.29%  | 0.38%  | 0.09%  | 0.39%  | 11.61% |
| Baa1 | 0.27%  | 0.27%  | 0.20%  | 0.08%  | 0.44%  | 0.17%  | 0.71%  | 78.03% | 2.74%  | 3.48%  | 2.12%  | 0.72%  | 0.89%  | 0.82%  | 0.65%  | 0.54%  | 0.28%  | 0.16%  | 0.06%  | 0.09%  | 0.46%  | 6.81%  |
| Baa2 | 0.23%  | 0.03%  | 0.14%  | 0.20%  | 0.39%  | 0.71%  | 0.51%  | 2.71%  | 73.46% | 4.21%  | 2.87%  | 1.24%  | 1.02%  | 0.53%  | 0.81%  | 0.49%  | 0.31%  | 0.24%  | 0.23%  | 0.65%  | 0.74%  | 8.29%  |
| Baa3 | 0.59%  | 0.07%  | 0.15%  | 0.16%  | 0.06%  | 0.46%  | 0.35%  | 0.73%  | 0.63%  | 77.94% | 2.04%  | 1.02%  | 1.49%  | 0.50%  | 0.62%  | 1.16%  | 0.38%  | 0.26%  | 0.25%  | 0.51%  | 0.26%  | 10.37% |
| Ba1  |        |        |        |        |        |        |        |        | 0.29%  | 10.29% | 67.95% | 2.08%  | 3.36%  | 1.21%  | 1.73%  | 1.86%  | 0.60%  | 1.12%  | 0.07%  | 0.80%  | 1.22%  | 7.42%  |
| Ba2  | 0.31%  | 0.07%  |        | 0.10%  | 0.07%  | 0.17%  | 0.07%  | 0.25%  | 0.11%  | 0.72%  | 0.45%  | 67.70% | 0.70%  | 2.23%  | 3.90%  | 2.49%  | 2.58%  | 1.83%  | 1.11%  | 2.24%  | 6.16%  | 6.73%  |
| Ba3  |        |        |        |        | 0.32%  | 0.22%  | 0.11%  | 0.19%  | 0.22%  | 1.40%  | 0.67%  |        | 63.71% | 2.06%  | 1.82%  | 4.39%  | 2.62%  | 2.27%  | 2.38%  | 3.09%  | 6.86%  | 7.66%  |
| B1   |        |        |        |        |        |        |        |        |        |        |        | 0.10%  |        | 66.01% | 1.54%  | 9.61%  | 3.70%  | 0.66%  | 5.80%  | 1.26%  | 8.87%  | 2.44%  |
| B2   |        |        |        |        |        |        |        |        |        |        |        |        |        |        | 66.91% | 1.50%  | 6.47%  | 3.71%  | 3.01%  | 7.23%  | 8.33%  | 2.85%  |
| B3   |        |        |        |        |        |        |        |        |        |        | 0.05%  |        |        |        |        | 70.75% | 3.61%  | 6.17%  | 3.50%  | 7.11%  | 5.14%  | 3.66%  |
| Caa1 |        |        |        |        |        |        |        |        |        | 0.13%  |        | 0.40%  |        |        |        |        | 67.36% | 2.93%  | 4.71%  | 13.06% | 8.84%  | 2.57%  |
| Caa2 |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        | 0.51%  |        | 66.82% | 1.70%  | 14.40% | 12.35% | 4.22%  |
| Caa3 |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        | 69.04% | 5.50%  | 15.79% | 9.66%  |
| Ca   |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        | 0.07%  |        |        |        | 79.90% | 12.12% | 7.91%  |
| C    |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        | 87.98% | 12.02% |

Figure 62 - US HEL One-Year Refined-Rating Transition Matrix by Cohort Rating (1989-2009)

|      | Aaa    | Aa1    | Aa2    | Aa3    | A1     | A2     | A3     | Baa1   | Baa2   | Baa3   | Ba1    | Ba2    | Ba3    | B1     | B2     | B3     | Caa1   | Caa2   | Caa3   | Ca     | C      | WR     |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Aaa  | 76.87% | 0.34%  | 0.68%  | 0.88%  | 0.44%  | 0.61%  | 0.37%  | 0.60%  | 0.40%  | 0.53%  | 0.30%  | 0.27%  | 0.39%  | 0.28%  | 0.28%  | 0.46%  | 0.20%  | 0.30%  | 0.13%  | 0.20%  | 0.03%  | 15.43% |
| Aa1  | 0.85%  | 67.34% | 0.99%  | 1.59%  | 1.99%  | 1.57%  | 1.48%  | 1.47%  | 1.19%  | 1.18%  | 1.45%  | 1.33%  | 1.78%  | 2.38%  | 1.38%  | 1.21%  | 0.53%  | 2.16%  | 0.59%  | 1.73%  | 4.27%  | 1.53%  |
| Aa2  | 1.89%  | 0.51%  | 77.25% | 0.59%  | 1.58%  | 1.41%  | 0.96%  | 0.90%  | 0.77%  | 0.55%  | 0.63%  | 0.44%  | 0.73%  | 1.18%  | 0.94%  | 0.62%  | 0.30%  | 0.88%  | 0.36%  | 0.78%  | 2.52%  | 4.20%  |
| Aa3  | 0.33%  | 0.37%  | 0.23%  | 59.54% | 1.64%  | 2.25%  | 1.76%  | 2.11%  | 1.76%  | 1.38%  | 1.23%  | 1.11%  | 1.85%  | 2.47%  | 3.17%  | 2.37%  | 0.81%  | 2.79%  | 0.51%  | 1.63%  | 8.41%  | 2.27%  |
| A1   | 0.13%  | 0.10%  | 0.31%  | 0.15%  | 57.28% | 2.19%  | 3.17%  | 3.30%  | 3.03%  | 1.98%  | 1.63%  | 1.33%  | 1.55%  | 2.33%  | 3.16%  | 3.40%  | 1.65%  | 2.78%  | 0.87%  | 1.59%  | 6.54%  | 1.52%  |
| A2   | 0.26%  | 0.14%  | 1.00%  | 0.71%  | 0.29%  | 73.25% | 0.69%  | 2.38%  | 2.26%  | 1.81%  | 1.28%  | 0.79%  | 0.80%  | 0.70%  | 1.22%  | 2.22%  | 0.87%  | 1.37%  | 0.55%  | 0.86%  | 3.07%  | 3.47%  |
| A3   | 0.05%  | 0.03%  | 0.15%  | 0.36%  | 0.29%  | 0.06%  | 61.46% | 1.65%  | 3.28%  | 3.14%  | 2.15%  | 1.67%  | 1.56%  | 1.34%  | 1.92%  | 2.88%  | 1.78%  | 2.60%  | 1.88%  | 2.14%  | 6.98%  | 2.63%  |
| Baa1 | 0.05%  |        | 0.01%  | 0.10%  | 0.23%  | 0.15%  | 0.12%  | 60.00% | 1.22%  | 2.97%  | 2.54%  | 2.12%  | 2.10%  | 1.87%  | 1.71%  | 3.65%  | 2.25%  | 3.20%  | 1.96%  | 2.97%  | 8.56%  | 2.22%  |
| Baa2 | 0.03%  | 0.03%  | 0.05%  | 0.04%  | 0.12%  | 0.49%  | 0.26%  | 0.11%  | 67.76% | 1.00%  | 2.26%  | 2.05%  | 1.71%  | 1.44%  | 1.45%  | 2.62%  | 1.31%  | 2.13%  | 1.65%  | 2.67%  | 6.80%  | 4.03%  |
| Baa3 | 0.11%  | 0.04%  | 0.01%  | 0.12%  | 0.11%  | 0.06%  | 0.23%  | 0.28%  | 0.18%  | 59.23% | 1.58%  | 2.02%  | 2.07%  | 2.03%  | 1.74%  | 3.52%  | 1.61%  | 2.26%  | 2.53%  | 4.87%  | 10.70% | 4.70%  |
| Ba1  |        |        |        |        |        |        | 0.07%  |        | 0.03%  | 0.22%  | 42.84% | 0.63%  | 1.71%  | 1.98%  | 1.85%  | 3.80%  | 2.28%  | 3.26%  | 3.19%  | 7.38%  | 25.03% | 5.72%  |
| Ba2  |        |        | 0.07%  |        | 0.05%  |        |        | 0.05%  | 0.20%  | 0.28%  | 0.05%  | 51.02% | 0.57%  | 1.46%  | 1.45%  | 2.60%  | 2.13%  | 3.22%  | 2.53%  | 5.58%  | 22.61% | 6.13%  |
| Ba3  |        |        | 0.07%  |        |        |        |        | 0.13%  |        |        |        |        | 31.56% | 0.75%  | 1.80%  | 3.12%  | 1.61%  | 3.65%  | 3.28%  | 7.95%  | 38.10% | 7.98%  |
| B1   |        |        |        |        |        |        |        |        |        |        |        |        |        | 14.29% | 0.35%  | 2.48%  | 1.94%  | 3.36%  | 2.41%  | 8.69%  | 61.38% | 5.10%  |
| B2   |        |        |        |        | 0.10%  |        |        | 0.10%  |        |        |        |        | 0.21%  |        | 28.65% | 0.78%  | 1.22%  | 2.26%  | 1.34%  | 5.24%  | 55.10% | 5.02%  |
| B3   |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        | 12.26% | 0.60%  | 2.62%  | 2.15%  | 5.38%  | 68.31% | 8.66%  |
| Caa1 |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        | 15.37% | 0.70%  | 1.65%  | 6.23%  | 68.73% | 7.31%  |
| Caa2 |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        | 20.84% | 0.42%  | 5.28%  | 65.05% | 8.42%  |
| Caa3 |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        | 21.72% | 3.14%  | 64.30% | 10.84% |
| Ca   |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        | 31.24% | 47.43% | 21.34% |
| C    |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        | 77.82% | 22.18% |



Figure 63 - US RMBS One-Year Refined-Rating Transition Matrix by Cohort Rating (1984-2009)

|      | Aaa    | Aa1    | Aa2    | Aa3    | A1     | A2     | A3     | Baa1   | Baa2   | Baa3   | Ba1    | Ba2    | Ba3    | B1     | B2     | B3     | Caa1   | Caa2   | Caa3   | Ca     | C      | WR     |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Aaa  | 79.59% | 0.40%  | 0.46%  | 0.50%  | 0.63%  | 0.32%  | 0.32%  | 0.46%  | 0.36%  | 0.49%  | 0.55%  | 0.30%  | 0.33%  | 0.28%  | 0.25%  | 1.08%  | 1.09%  | 0.87%  | 0.45%  | 0.60%  | 0.05%  | 10.60% |
| Aa1  | 6.91%  | 68.20% | 0.49%  | 0.61%  | 0.60%  | 0.58%  | 0.64%  | 0.53%  | 0.73%  | 0.77%  | 0.95%  | 0.70%  | 0.81%  | 0.71%  | 0.75%  | 1.26%  | 0.83%  | 0.56%  | 0.64%  | 4.12%  | 2.53%  | 6.08%  |
| Aa2  | 4.58%  | 1.36%  | 74.83% | 0.90%  | 0.78%  | 0.71%  | 0.50%  | 0.54%  | 0.63%  | 0.49%  | 0.60%  | 0.30%  | 0.39%  | 0.50%  | 0.72%  | 1.19%  | 0.60%  | 0.44%  | 0.27%  | 0.93%  | 2.51%  | 6.24%  |
| Aa3  | 3.15%  | 1.58%  | 1.25%  | 64.83% | 1.41%  | 1.15%  | 0.85%  | 0.67%  | 0.67%  | 0.87%  | 0.57%  | 0.46%  | 0.77%  | 1.12%  | 1.22%  | 3.07%  | 1.22%  | 1.89%  | 0.76%  | 2.09%  | 5.47%  | 4.94%  |
| A1   | 1.26%  | 0.72%  | 1.23%  | 0.68%  | 55.64% | 2.84%  | 1.66%  | 0.93%  | 1.12%  | 0.93%  | 1.04%  | 0.78%  | 0.79%  | 1.03%  | 1.66%  | 4.05%  | 3.36%  | 2.59%  | 1.83%  | 4.08%  | 6.21%  | 5.57%  |
| A2   | 0.68%  | 0.32%  | 2.73%  | 0.91%  | 0.71%  | 68.79% | 0.74%  | 1.06%  | 1.12%  | 0.92%  | 0.92%  | 0.60%  | 0.78%  | 0.90%  | 1.06%  | 2.20%  | 1.38%  | 1.27%  | 0.83%  | 3.14%  | 4.03%  | 4.91%  |
| A3   | 1.18%  | 0.12%  | 0.38%  | 1.78%  | 0.68%  | 0.64%  | 61.30% | 1.18%  | 1.59%  | 1.38%  | 0.95%  | 0.75%  | 1.29%  | 0.98%  | 1.17%  | 3.11%  | 2.04%  | 2.04%  | 0.75%  | 5.93%  | 7.38%  | 3.39%  |
| Baa1 | 0.30%  |        | 0.11%  | 0.09%  | 0.80%  | 0.91%  | 0.66%  | 50.48% | 1.03%  | 1.86%  | 2.16%  | 1.30%  | 1.33%  | 1.42%  | 1.45%  | 3.36%  | 2.48%  | 3.69%  | 1.17%  | 10.77% | 11.97% | 2.67%  |
| Baa2 | 0.27%  | 0.07%  | 0.19%  | 0.23%  | 0.32%  | 2.26%  | 0.89%  | 0.68%  | 69.06% | 0.61%  | 1.08%  | 0.68%  | 0.63%  | 1.01%  | 0.78%  | 1.77%  | 1.06%  | 1.07%  | 0.88%  | 5.58%  | 6.54%  | 4.33%  |
| Baa3 | 0.18%  | 0.06%  | 0.16%  | 0.04%  | 0.31%  | 0.44%  | 1.22%  | 0.74%  | 0.24%  | 65.20% | 0.47%  | 0.79%  | 1.05%  | 0.72%  | 0.83%  | 1.80%  | 1.30%  | 1.92%  | 0.91%  | 7.72%  | 8.94%  | 4.99%  |
| Ba1  | 0.20%  |        |        |        | 0.02%  | 0.60%  | 0.16%  | 0.48%  | 0.92%  | 0.80%  | 49.39% | 0.41%  | 0.72%  | 0.61%  | 0.64%  | 1.75%  | 1.60%  | 2.44%  | 3.34%  | 12.05% | 19.56% | 4.31%  |
| Ba2  | 0.05%  | 0.04%  | 0.04%  | 0.03%  | 0.02%  | 0.18%  | 0.28%  | 0.42%  | 2.80%  | 1.01%  | 1.13%  | 68.78% | 0.24%  | 0.38%  | 0.63%  | 1.54%  | 0.80%  | 1.46%  | 1.10%  | 6.88%  | 8.39%  | 3.81%  |
| Ba3  | 0.05%  |        |        | 0.09%  | 0.37%  | 0.27%  | 0.30%  | 0.18%  | 0.59%  | 1.95%  | 1.05%  | 0.52%  | 57.67% | 0.29%  | 0.52%  | 1.17%  | 0.67%  | 2.31%  | 1.30%  | 8.55%  | 17.82% | 4.33%  |
| B1   |        |        |        |        |        |        |        |        | 0.17%  |        |        | 0.49%  | 0.29%  | 33.59% | 0.06%  | 1.21%  | 0.75%  | 1.18%  | 1.03%  | 9.27%  | 48.05% | 3.92%  |
| B2   |        | 0.03%  |        |        |        | 0.05%  |        |        | 0.10%  | 0.14%  | 0.57%  | 1.80%  | 1.06%  | 0.62%  | 63.03% | 0.22%  | 0.29%  | 0.37%  | 1.13%  | 4.83%  | 21.72% | 4.03%  |
| B3   |        |        | 0.03%  |        | 0.13%  |        |        | 0.08%  |        | 0.15%  |        | 0.08%  | 0.60%  | 0.15%  | 0.15%  | 32.21% | 0.69%  | 0.78%  | 0.68%  | 5.45%  | 55.88% | 2.92%  |
| Caa1 |        |        |        |        |        | 0.03%  |        |        |        |        |        |        |        |        |        |        | 41.59% | 0.25%  | 0.19%  | 5.94%  | 49.61% | 2.40%  |
| Caa2 |        |        |        |        |        |        |        |        |        |        |        | 0.39%  |        |        |        |        | 4.87%  | 38.06% | 1.66%  | 5.55%  | 44.07% | 5.39%  |
| Caa3 |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        | 24.47% | 10.66% | 57.87% | 7.00%  |
| Ca   |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        | 8.41%  | 86.78% | 4.80%  |
| C    |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        | 90.24% | 9.76%  |

Figure 64 - US CMBS One-Year Refined-Rating Transition Matrix by Cohort Rating (1987-2009)

|      | Aaa    | Aa1    | Aa2    | Aa3    | A1     | A2     | A3     | Baa1   | Baa2   | Baa3   | Ba1    | Ba2    | Ba3    | B1     | B2     | B3    | Caa1   | Caa2  | Caa3   | Ca     | C      | WR     |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|--------|-------|--------|--------|--------|--------|
| Aaa  | 88.99% | 0.32%  | 0.30%  | 0.33%  | 0.37%  | 0.29%  | 0.09%  | 0.09%  | 0.06%  | 0.08%  | 0.08%  | 0.04%  | 0.07%  | 0.03%  | 0.01%  | 0.02% |        |       |        | 0.02%  |        | 8.82%  |
| Aa1  | 25.98% | 53.15% | 2.29%  | 1.13%  | 2.05%  | 1.65%  | 1.85%  | 0.07%  | 0.22%  | 0.58%  | 0.49%  | 0.28%  | 0.24%  | 0.47%  | 0.18%  | 0.14% | 0.28%  |       |        |        |        | 8.92%  |
| Aa2  | 11.74% | 4.40%  | 70.71% | 0.67%  | 0.73%  | 1.07%  | 1.34%  | 1.08%  | 0.30%  | 0.30%  | 0.32%  | 0.16%  | 0.28%  | 0.20%  | 0.29%  | 0.14% | 0.10%  | 0.03% | 0.01%  | 0.02%  | 0.01%  | 6.11%  |
| Aa3  | 10.33% | 4.44%  | 7.42%  | 61.91% | 1.19%  | 1.07%  | 2.66%  | 2.42%  | 2.01%  | 0.37%  | 0.16%  | 0.26%  | 0.10%  | 0.26%  | 0.30%  | 0.15% | 0.17%  | 0.10% | 0.01%  | 0.05%  | 0.05%  | 4.54%  |
| A1   | 8.19%  | 3.54%  | 4.95%  | 5.74%  | 57.67% | 1.07%  | 1.27%  | 1.99%  | 1.96%  | 1.90%  | 0.54%  | 0.49%  | 0.72%  | 0.27%  | 0.64%  | 0.41% | 0.73%  | 0.41% | 0.05%  | 0.06%  | 0.03%  | 7.37%  |
| A2   | 2.47%  | 1.77%  | 3.10%  | 3.59%  | 5.13%  | 70.94% | 1.27%  | 1.11%  | 1.33%  | 1.50%  | 1.30%  | 0.53%  | 0.18%  | 0.23%  | 0.22%  | 0.25% | 0.19%  | 0.32% | 0.15%  | 0.08%  | 0.04%  | 4.30%  |
| A3   | 1.78%  | 1.02%  | 1.75%  | 2.81%  | 3.99%  | 5.36%  | 68.72% | 1.26%  | 1.35%  | 1.80%  | 1.70%  | 1.75%  | 0.66%  | 0.24%  | 0.44%  | 0.42% | 0.34%  | 0.38% | 0.36%  | 0.10%  | 0.03%  | 3.75%  |
| Baa1 | 1.41%  | 0.23%  | 0.75%  | 1.06%  | 2.32%  | 3.63%  | 4.28%  | 67.44% | 1.36%  | 1.38%  | 1.85%  | 1.99%  | 2.08%  | 1.69%  | 0.44%  | 0.36% | 0.56%  | 0.53% | 0.52%  | 0.07%  | 0.17%  | 5.91%  |
| Baa2 | 0.66%  | 0.15%  | 0.49%  | 0.52%  | 0.84%  | 2.40%  | 3.28%  | 4.36%  | 73.24% | 1.37%  | 1.11%  | 1.17%  | 0.67%  | 1.01%  | 1.52%  | 0.57% | 0.33%  | 0.36% | 0.52%  | 0.07%  | 0.13%  | 5.22%  |
| Baa3 | 0.44%  |        | 0.16%  | 0.20%  | 0.53%  | 0.45%  | 1.05%  | 2.59%  | 4.11%  | 73.00% | 1.25%  | 1.30%  | 2.17%  | 0.65%  | 0.75%  | 2.20% | 0.87%  | 0.63% | 0.69%  | 0.21%  | 0.12%  | 6.64%  |
| Ba1  | 0.29%  |        | 0.06%  |        | 0.11%  | 0.23%  | 0.52%  | 0.68%  | 1.29%  | 3.23%  | 78.65% | 1.27%  | 1.45%  | 1.66%  | 0.87%  | 0.65% | 2.55%  | 1.76% | 0.87%  | 0.35%  | 0.23%  | 3.27%  |
| Ba2  | 0.16%  |        |        |        | 0.15%  | 0.05%  | 0.06%  | 0.13%  | 0.90%  | 0.96%  | 2.64%  | 81.24% | 1.55%  | 1.15%  | 1.36%  | 0.98% | 2.06%  | 1.89% | 1.44%  | 0.45%  | 0.24%  | 2.59%  |
| Ba3  | 0.16%  |        |        |        | 0.02%  | 0.07%  | 0.05%  | 0.12%  | 0.84%  | 0.80%  | 1.65%  | 82.40% | 1.95%  | 1.40%  | 1.23%  | 0.97% | 2.99%  | 2.02% | 0.53%  | 0.33%  | 2.45%  |        |
| B1   | 0.18%  |        |        |        | 0.01%  |        |        | 0.01%  | 0.27%  | 0.13%  | 0.44%  | 0.68%  | 82.44% | 2.60%  | 2.10%  | 1.40% | 3.29%  | 2.92% | 1.10%  | 0.39%  | 2.04%  |        |
| B2   | 0.11%  |        |        |        | 0.01%  | 0.02%  | 0.03%  |        | 0.07%  | 0.06%  | 0.58%  | 0.51%  | 0.52%  | 82.38% | 3.42%  | 2.59% | 2.04%  | 4.23% | 1.26%  | 0.50%  | 1.67%  |        |
| B3   | 0.01%  |        | 0.04%  |        |        |        |        |        | 0.04%  | 0.07%  | 0.02%  | 0.08%  | 0.31%  | 0.53%  | 81.30% | 4.33% | 3.07%  | 5.38% | 2.39%  | 0.66%  | 1.77%  |        |
| Caa1 | 0.26%  |        |        |        |        |        |        |        |        |        |        |        | 0.38%  | 0.68%  | 0.23%  | 0.45% | 65.55% | 6.99% | 8.98%  | 8.98%  | 3.49%  | 4.02%  |
| Caa2 |        |        |        |        |        |        |        |        |        |        |        | 0.12%  |        | 0.20%  | 0.92%  | 1.07% | 70.93% | 7.63% | 10.41% | 4.68%  | 4.04%  |        |
| Caa3 |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |       |        | 0.50% | 73.25% | 12.00% | 8.33%  | 5.92%  |
| Ca   |        |        |        |        |        |        |        |        |        |        |        |        |        | 0.34%  |        | 0.34% |        |       |        | 73.16% | 16.71% | 9.45%  |
| C    |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |       |        |       |        |        | 81.11% | 18.89% |

Figure 65 - US CDO One-Year Refined-Rating Transition Matrix by Cohort Rating (1990-2009)

|      | Aaa    | Aa1    | Aa2    | Aa3    | A1     | A2     | A3     | Baa1   | Baa2   | Baa3   | Ba1    | Ba2    | Ba3    | B1     | B2    | B3     | Caa1   | Caa2   | Caa3   | Ca     | C      | WR     |        |        |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Aaa  | 75.73% | 1.42%  | 1.55%  | 1.61%  | 1.12%  | 0.76%  | 0.71%  | 0.47%  | 0.46%  | 0.60%  | 0.94%  | 0.51%  | 0.51%  | 0.65%  | 0.39% | 0.49%  | 0.45%  | 0.57%  | 0.73%  | 2.10%  | 1.30%  | 6.93%  |        |        |
| Aa1  | 2.40%  | 69.36% | 1.68%  | 1.89%  | 2.39%  | 1.60%  | 1.20%  | 0.62%  | 0.68%  | 1.01%  | 0.96%  | 0.59%  | 0.41%  | 0.76%  | 0.70% | 0.50%  | 0.70%  | 0.62%  | 1.17%  | 2.78%  | 0.96%  | 7.02%  |        |        |
| Aa2  | 0.67%  | 0.51%  | 70.25% | 1.33%  | 1.77%  | 1.90%  | 1.89%  | 1.28%  | 1.00%  | 1.00%  | 0.99%  | 0.55%  | 0.49%  | 0.73%  | 0.60% | 0.96%  | 0.71%  | 0.58%  | 1.26%  | 3.89%  | 2.55%  | 5.10%  |        |        |
| Aa3  | 1.64%  | 0.38%  | 0.37%  | 58.43% | 2.60%  | 1.44%  | 2.16%  | 1.68%  | 1.11%  | 1.76%  | 1.18%  | 1.27%  | 1.03%  | 0.36%  | 0.66% | 1.01%  | 0.96%  | 1.39%  | 1.96%  | 6.53%  | 3.17%  | 8.90%  |        |        |
| A1   | 1.32%  | 0.49%  | 1.71%  | 0.49%  | 63.11% | 0.93%  | 1.03%  | 1.52%  | 1.86%  | 2.20%  | 1.71%  | 0.43%  | 0.44%  | 0.55%  | 0.37% | 0.79%  | 0.48%  | 1.63%  | 1.26%  | 4.15%  | 3.87%  | 9.67%  |        |        |
| A2   | 0.27%  | 0.07%  | 0.28%  | 0.19%  | 0.36%  | 64.75% | 0.48%  | 0.74%  | 1.18%  | 4.78%  | 5.26%  | 1.74%  | 1.04%  | 0.56%  | 0.56% | 0.66%  | 0.42%  | 0.74%  | 0.79%  | 4.86%  | 4.92%  | 5.35%  |        |        |
| A3   | 0.56%  | 0.19%  | 0.44%  | 0.69%  | 0.37%  | 0.33%  | 68.52% | 1.16%  | 1.57%  | 1.70%  | 1.33%  | 1.16%  | 0.56%  | 0.83%  | 0.74% | 0.74%  | 0.96%  | 0.63%  | 1.85%  | 5.10%  | 4.11%  | 6.46%  |        |        |
| Baa1 | 0.89%  | 0.52%  | 0.07%  | 0.03%  | 0.52%  | 0.50%  | 0.13%  | 60.40% | 0.57%  | 2.42%  | 1.60%  | 0.80%  | 1.65%  | 1.01%  | 0.45% | 0.57%  | 0.58%  | 1.78%  | 2.25%  | 7.39%  | 6.37%  | 9.51%  |        |        |
| Baa2 | 0.05%  | 0.02%  | 0.13%  | 0.10%  | 0.10%  | 0.19%  | 0.16%  | 0.20%  | 68.75% | 1.05%  | 1.15%  | 1.19%  | 3.14%  | 3.78%  | 1.01% | 1.29%  | 0.89%  | 1.05%  | 1.26%  | 3.96%  | 5.29%  | 5.24%  |        |        |
| Baa3 | 0.19%  | 0.14%  | 0.03%  | 0.19%  | 0.01%  | 0.21%  | 0.34%  | 0.20%  | 0.15%  | 63.89% | 1.56%  | 1.71%  | 2.58%  | 2.61%  | 1.71% | 1.14%  | 0.58%  | 1.30%  | 1.41%  | 5.85%  | 6.70%  | 7.50%  |        |        |
| Ba1  | 0.27%  | 0.13%  |        | 0.13%  | 0.03%  | 0.13%  | 0.02%  | 0.80%  | 0.27%  | 0.13%  | 46.59% | 1.40%  | 1.00%  | 3.00%  | 1.93% | 0.96%  | 1.18%  | 2.87%  | 2.75%  | 12.53% | 16.92% | 6.95%  |        |        |
| Ba2  |        |        |        | 0.06%  | 0.01%  | 0.03%  | 0.04%  | 0.14%  | 0.17%  | 0.40%  | 0.10%  | 66.77% | 0.65%  | 0.94%  | 1.11% | 4.41%  | 0.92%  | 3.68%  | 3.50%  | 5.26%  | 5.44%  | 6.39%  |        |        |
| Ba3  |        |        |        |        |        | 0.31%  | 0.08%  |        | 0.02%  | 0.59%  | 0.34%  | 0.46%  | 64.37% | 1.54%  | 0.65% | 1.81%  | 1.68%  | 1.63%  | 1.40%  | 6.22%  | 9.82%  | 9.10%  |        |        |
| B1   |        |        |        | 0.21%  | 0.21%  | 0.02%  | 0.21%  | 0.10%  | 0.83%  | 0.21%  | 0.42%  | 0.64%  |        | 42.88% | 1.69% | 2.23%  | 2.68%  | 3.32%  | 3.23%  | 12.09% | 21.77% | 7.26%  |        |        |
| B2   |        |        |        |        |        |        |        |        |        |        |        | 0.69%  |        | 0.69%  | 0.40% | 0.46%  | 55.28% | 0.17%  | 2.24%  | 3.50%  | 1.99%  | 10.16% | 13.83% | 10.58% |
| B3   |        |        |        |        |        |        |        |        |        | 0.13%  | 0.54%  | 1.17%  | 0.52%  | 0.20%  | 0.31% | 34.38% | 1.44%  | 4.94%  | 5.92%  | 16.25% | 25.72% | 8.48%  |        |        |
| Caa1 |        |        |        |        |        |        |        |        |        | 0.18%  |        | 0.37%  |        | 0.37%  | 0.21% | 0.73%  | 37.35% | 0.30%  | 5.09%  | 15.98% | 32.38% | 7.04%  |        |        |
| Caa2 |        |        |        |        |        |        |        |        |        |        | 0.58%  |        |        |        | 0.31% | 1.42%  |        | 35.88% | 3.49%  | 18.21% | 29.75% | 10.37% |        |        |
| Caa3 |        |        |        |        |        |        |        | 0.06%  |        | 0.19%  |        |        |        | 0.58%  | 0.86% | 0.19%  | 0.58%  | 0.11%  | 36.51% | 16.69% | 35.15% | 9.06%  |        |        |
| Ca   |        |        |        |        |        |        |        |        |        |        | 0.07%  |        |        |        |       |        | 0.07%  |        | 0.03%  | 51.50% | 39.76% | 8.57%  |        |        |
| C    |        |        |        |        |        |        |        |        |        |        |        |        |        |        |       |        |        | 0.12%  |        |        | 81.67% | 18.20% |        |        |

## Matrices by Original Rating

Figure 66 - Global Structured Finance Rating Transition Matrices by Original Rating (1984-2009)

| 1-year  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  | WR     |
|---------|--------|--------|--------|--------|--------|--------|--------|--------|
| Aaa     | 93.79% | 0.62%  | 0.32%  | 0.27%  | 0.16%  | 0.15%  | 0.38%  | 4.30%  |
| Aa      | 0.75%  | 92.10% | 1.45%  | 0.86%  | 0.85%  | 1.71%  | 1.23%  | 1.05%  |
| A       | 0.12%  | 0.49%  | 87.04% | 3.56%  | 1.98%  | 2.67%  | 2.82%  | 1.31%  |
| Baa     | 0.04%  | 0.03%  | 0.28%  | 86.89% | 2.42%  | 2.61%  | 6.51%  | 1.21%  |
| Ba      | 0.00%  | 0.02%  | 0.00%  | 0.39%  | 88.39% | 1.97%  | 7.76%  | 1.48%  |
| B       | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.67%  | 91.84% | 2.50%  | 4.99%  |
| Caa-C   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 92.66% | 7.34%  |
| 3-year  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  | WR     |
| Aaa     | 62.03% | 1.81%  | 1.24%  | 1.07%  | 1.19%  | 2.05%  | 5.77%  | 24.84% |
| Aa      | 5.28%  | 58.85% | 4.52%  | 2.69%  | 1.54%  | 1.56%  | 16.71% | 8.85%  |
| A       | 1.34%  | 3.57%  | 56.84% | 6.23%  | 3.15%  | 1.86%  | 18.11% | 8.90%  |
| Baa     | 0.48%  | 0.66%  | 2.55%  | 54.54% | 5.01%  | 4.78%  | 20.21% | 11.76% |
| Ba      | 0.02%  | 0.13%  | 0.78%  | 2.59%  | 52.30% | 4.86%  | 24.60% | 14.73% |
| B       | 0.06%  | 0.06%  | 0.17%  | 0.23%  | 3.69%  | 68.66% | 16.19% | 10.94% |
| Caa-C   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 1.05%  | 0.00%  | 74.74% | 24.21% |
| 5-year  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  | WR     |
| Aaa     | 46.23% | 2.08%  | 1.33%  | 0.68%  | 0.31%  | 0.29%  | 0.38%  | 48.70% |
| Aa      | 14.69% | 44.08% | 5.25%  | 3.54%  | 1.50%  | 0.89%  | 2.40%  | 27.66% |
| A       | 2.74%  | 7.63%  | 43.18% | 7.14%  | 4.08%  | 1.78%  | 5.16%  | 28.28% |
| Baa     | 0.89%  | 1.32%  | 5.50%  | 39.48% | 6.93%  | 4.98%  | 14.02% | 26.88% |
| Ba      | 0.26%  | 0.26%  | 1.76%  | 5.87%  | 47.14% | 4.64%  | 17.27% | 22.80% |
| B       | 0.00%  | 0.09%  | 0.26%  | 0.69%  | 4.82%  | 58.18% | 18.42% | 17.56% |
| Caa-C   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 2.00%  | 2.00%  | 58.00% | 38.00% |
| 7-year  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  | WR     |
| Aaa     | 29.02% | 0.79%  | 0.51%  | 0.43%  | 0.15%  | 0.19%  | 0.30%  | 68.61% |
| Aa      | 19.27% | 22.53% | 3.20%  | 2.76%  | 0.99%  | 1.05%  | 2.31%  | 47.89% |
| A       | 5.97%  | 7.15%  | 22.92% | 4.50%  | 2.84%  | 1.10%  | 3.98%  | 51.54% |
| Baa     | 2.13%  | 2.85%  | 7.13%  | 21.75% | 3.64%  | 2.58%  | 13.13% | 46.79% |
| Ba      | 0.36%  | 0.42%  | 2.86%  | 6.61%  | 28.89% | 4.53%  | 14.23% | 42.11% |
| B       | 0.27%  | 0.00%  | 0.00%  | 1.37%  | 3.55%  | 37.57% | 24.73% | 32.51% |
| Caa-C   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 2.70%  | 5.41%  | 51.35% | 40.54% |
| 10-year | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  | WR     |
| Aaa     | 14.76% | 0.51%  | 0.50%  | 0.34%  | 0.16%  | 0.17%  | 0.13%  | 83.44% |
| Aa      | 8.29%  | 10.64% | 1.67%  | 1.08%  | 0.35%  | 0.80%  | 1.79%  | 75.38% |
| A       | 4.16%  | 2.10%  | 13.43% | 1.33%  | 0.21%  | 0.34%  | 2.58%  | 75.84% |
| Baa     | 4.90%  | 2.15%  | 2.81%  | 10.79% | 1.65%  | 2.26%  | 13.66% | 61.78% |
| Ba      | 1.62%  | 1.76%  | 2.21%  | 3.53%  | 9.85%  | 1.91%  | 12.94% | 66.18% |
| B       | 0.28%  | 0.28%  | 0.56%  | 1.41%  | 1.69%  | 13.24% | 23.66% | 58.87% |
| Caa-C   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 34.78% | 65.22% |

**Figure 67 - Global Structured Finance excl SF CDOs, Other SF, and '05-'07 vintage US HEL & RMBS Rating Transition Matrices by Original Rating (1984-2009)**

| <b>1-year</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> | <b>WR</b> |
|----------------|------------|-----------|----------|------------|-----------|----------|--------------|-----------|
| Aaa            | 93.35%     | 0.48%     | 0.14%    | 0.11%      | 0.01%     | 0.05%    | 0.06%        | 5.78%     |
| Aa             | 1.19%      | 95.53%    | 1.28%    | 0.19%      | 0.08%     | 0.02%    | 0.15%        | 1.57%     |
| A              | 0.19%      | 0.75%     | 94.82%   | 1.73%      | 0.37%     | 0.10%    | 0.23%        | 1.80%     |
| Baa            | 0.07%      | 0.04%     | 0.42%    | 96.40%     | 0.95%     | 0.41%    | 0.31%        | 1.40%     |
| Ba             | 0.00%      | 0.02%     | 0.00%    | 0.57%      | 96.80%    | 0.74%    | 0.78%        | 1.09%     |
| B              | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.73%     | 92.62%   | 1.73%        | 4.92%     |
| Caa-C          | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 0.00%    | 92.57%       | 7.43%     |
| <b>3-year</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> | <b>WR</b> |
| Aaa            | 67.76%     | 1.16%     | 0.55%    | 0.34%      | 0.16%     | 0.11%    | 0.08%        | 29.83%    |
| Aa             | 7.81%      | 70.82%    | 4.30%    | 2.36%      | 0.86%     | 0.42%    | 1.62%        | 11.82%    |
| A              | 1.94%      | 4.93%     | 70.81%   | 6.10%      | 2.90%     | 0.97%    | 2.22%        | 10.14%    |
| Baa            | 0.72%      | 0.92%     | 3.76%    | 70.60%     | 5.10%     | 4.23%    | 3.38%        | 11.28%    |
| Ba             | 0.03%      | 0.19%     | 1.13%    | 3.64%      | 67.40%    | 5.76%    | 14.04%       | 7.82%     |
| B              | 0.06%      | 0.06%     | 0.19%    | 0.25%      | 3.93%     | 70.28%   | 14.83%       | 10.40%    |
| Caa-C          | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 1.06%     | 0.00%    | 74.47%       | 24.47%    |
| <b>5-year</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> | <b>WR</b> |
| Aaa            | 46.25%     | 1.97%     | 1.28%    | 0.64%      | 0.24%     | 0.23%    | 0.17%        | 49.22%    |
| Aa             | 15.12%     | 44.67%    | 5.18%    | 3.56%      | 1.34%     | 0.78%    | 1.40%        | 27.95%    |
| A              | 2.80%      | 7.68%     | 43.72%   | 7.21%      | 4.11%     | 1.81%    | 4.15%        | 28.51%    |
| Baa            | 0.93%      | 1.34%     | 5.64%    | 40.37%     | 7.10%     | 4.98%    | 12.42%       | 27.22%    |
| Ba             | 0.27%      | 0.27%     | 1.85%    | 5.93%      | 48.94%    | 4.67%    | 16.77%       | 21.29%    |
| B              | 0.00%      | 0.09%     | 0.26%    | 0.69%      | 4.86%     | 58.37%   | 18.47%       | 17.26%    |
| Caa-C          | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 2.00%     | 2.00%    | 58.00%       | 38.00%    |
| <b>7-year</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> | <b>WR</b> |
| Aaa            | 28.93%     | 0.71%     | 0.48%    | 0.38%      | 0.11%     | 0.17%    | 0.21%        | 69.01%    |
| Aa             | 19.58%     | 22.66%    | 3.25%    | 2.75%      | 0.88%     | 1.01%    | 1.69%        | 48.18%    |
| A              | 6.07%      | 7.08%     | 23.04%   | 4.50%      | 2.85%     | 1.12%    | 3.60%        | 51.74%    |
| Baa            | 2.21%      | 2.96%     | 7.37%    | 22.29%     | 3.71%     | 2.58%    | 11.67%       | 47.21%    |
| Ba             | 0.37%      | 0.44%     | 2.93%    | 6.67%      | 29.91%    | 4.67%    | 13.83%       | 41.18%    |
| B              | 0.28%      | 0.00%     | 0.00%    | 1.38%      | 3.45%     | 37.79%   | 24.83%       | 32.28%    |
| Caa-C          | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 2.70%     | 5.41%    | 51.35%       | 40.54%    |
| <b>10-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> | <b>WR</b> |
| Aaa            | 14.55%     | 0.47%     | 0.48%    | 0.34%      | 0.15%     | 0.17%    | 0.13%        | 83.71%    |
| Aa             | 8.16%      | 10.51%    | 1.68%    | 1.09%      | 0.36%     | 0.81%    | 1.80%        | 75.58%    |
| A              | 4.18%      | 2.11%     | 13.49%   | 1.34%      | 0.22%     | 0.34%    | 2.59%        | 75.74%    |
| Baa            | 4.93%      | 2.16%     | 2.83%    | 10.86%     | 1.66%     | 2.27%    | 13.69%       | 61.59%    |
| Ba             | 1.65%      | 1.80%     | 2.25%    | 3.59%      | 9.88%     | 1.95%    | 13.17%       | 65.72%    |
| B              | 0.29%      | 0.29%     | 0.57%    | 1.43%      | 1.71%     | 13.43%   | 24.00%       | 58.29%    |
| Caa-C          | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 0.00%    | 34.78%       | 65.22%    |









Figure 71 - US CMBS Rating Transition Matrices by Original Rating (1987-2009)

| 1-year  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  | WR     |
|---------|--------|--------|--------|--------|--------|--------|--------|--------|
| Aaa     | 97.58% | 0.61%  | 0.22%  | 0.00%  | 0.02%  | 0.00%  | 0.00%  | 1.57%  |
| Aa      | 1.67%  | 95.36% | 1.42%  | 0.52%  | 0.13%  | 0.00%  | 0.00%  | 0.90%  |
| A       | 0.24%  | 0.78%  | 95.03% | 2.03%  | 1.08%  | 0.12%  | 0.06%  | 0.66%  |
| Baa     | 0.00%  | 0.08%  | 0.51%  | 95.21% | 1.11%  | 0.83%  | 0.12%  | 2.14%  |
| Ba      | 0.00%  | 0.00%  | 0.00%  | 0.43%  | 97.57% | 0.36%  | 1.22%  | 0.43%  |
| B       | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.09%  | 97.36% | 2.09%  | 0.46%  |
| Caa-C   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 97.30% | 2.70%  |
| 3-year  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  | WR     |
| Aaa     | 81.20% | 2.04%  | 1.61%  | 0.49%  | 0.37%  | 0.06%  | 0.03%  | 14.21% |
| Aa      | 9.44%  | 58.74% | 8.03%  | 4.13%  | 1.64%  | 1.56%  | 0.47%  | 15.99% |
| A       | 2.34%  | 4.98%  | 61.05% | 8.86%  | 5.34%  | 1.98%  | 3.22%  | 12.23% |
| Baa     | 0.89%  | 0.89%  | 3.44%  | 57.42% | 6.97%  | 6.41%  | 3.82%  | 20.16% |
| Ba      | 0.00%  | 0.09%  | 0.61%  | 1.47%  | 72.42% | 4.77%  | 14.83% | 5.81%  |
| B       | 0.11%  | 0.11%  | 0.11%  | 0.22%  | 0.55%  | 77.10% | 18.69% | 3.10%  |
| Caa-C   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 3.03%  | 0.00%  | 87.88% | 9.09%  |
| 5-year  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  | WR     |
| Aaa     | 66.51% | 0.82%  | 0.15%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 32.51% |
| Aa      | 28.26% | 36.17% | 1.56%  | 0.84%  | 0.72%  | 0.00%  | 0.48%  | 31.98% |
| A       | 8.36%  | 16.16% | 44.52% | 3.39%  | 1.58%  | 0.45%  | 0.00%  | 25.54% |
| Baa     | 2.46%  | 2.24%  | 8.97%  | 44.86% | 3.26%  | 0.58%  | 0.51%  | 37.12% |
| Ba      | 0.28%  | 0.43%  | 0.71%  | 4.55%  | 72.69% | 7.54%  | 2.42%  | 11.38% |
| B       | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 1.18%  | 72.73% | 16.84% | 9.26%  |
| Caa-C   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 3.13%  | 81.25% | 15.63% |
| 7-year  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  | WR     |
| Aaa     | 54.99% | 0.67%  | 0.25%  | 0.08%  | 0.00%  | 0.00%  | 0.00%  | 44.01% |
| Aa      | 43.21% | 13.04% | 1.07%  | 0.54%  | 1.07%  | 0.00%  | 0.36%  | 40.71% |
| A       | 28.40% | 24.16% | 13.58% | 2.65%  | 0.53%  | 0.18%  | 0.53%  | 29.98% |
| Baa     | 5.16%  | 8.35%  | 18.13% | 22.86% | 1.21%  | 0.77%  | 0.99%  | 42.53% |
| Ba      | 0.48%  | 0.97%  | 1.93%  | 10.63% | 55.56% | 9.66%  | 4.35%  | 16.43% |
| B       | 0.00%  | 0.00%  | 0.00%  | 0.81%  | 2.17%  | 48.51% | 30.62% | 17.89% |
| Caa-C   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 6.90%  | 65.52% | 27.59% |
| 10-year | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa-C  | WR     |
| Aaa     | 22.95% | 0.18%  | 0.55%  | 0.18%  | 0.00%  | 0.00%  | 0.00%  | 76.14% |
| Aa      | 11.22% | 6.09%  | 0.64%  | 0.32%  | 0.00%  | 0.00%  | 0.64%  | 81.09% |
| A       | 18.70% | 2.61%  | 4.35%  | 0.87%  | 0.00%  | 0.00%  | 0.87%  | 72.61% |
| Baa     | 22.51% | 7.40%  | 5.79%  | 2.57%  | 0.32%  | 1.61%  | 2.25%  | 57.56% |
| Ba      | 5.93%  | 5.19%  | 8.89%  | 11.11% | 20.00% | 5.19%  | 5.19%  | 38.52% |
| B       | 0.00%  | 0.00%  | 0.76%  | 1.52%  | 3.03%  | 21.21% | 37.12% | 36.36% |
| Caa-C   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 44.44% | 55.56% |



**Figure 73 - Global Structured Finance Rating Transition Matrices by Original Rating using Rating before WR (1984-2009)**

| <b>1-year</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
|----------------|------------|-----------|----------|------------|-----------|----------|--------------|
| Aaa            | 98.05%     | 0.64%     | 0.33%    | 0.27%      | 0.16%     | 0.15%    | 0.40%        |
| Aa             | 0.79%      | 93.05%    | 1.48%    | 0.87%      | 0.86%     | 1.72%    | 1.24%        |
| A              | 0.12%      | 0.51%     | 88.25%   | 3.57%      | 1.98%     | 2.68%    | 2.88%        |
| Baa            | 0.04%      | 0.03%     | 0.28%    | 87.87%     | 2.44%     | 2.62%    | 6.71%        |
| Ba             | 0.00%      | 0.02%     | 0.00%    | 0.39%      | 89.53%    | 1.99%    | 8.07%        |
| B              | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.77%     | 96.74%   | 2.50%        |
| Caa-C          | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 0.00%    | 100.00%      |
| <b>3-year</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
| Aaa            | 86.45%     | 1.92%     | 1.29%    | 1.09%      | 1.20%     | 2.12%    | 5.94%        |
| Aa             | 6.93%      | 64.81%    | 4.80%    | 2.74%      | 1.56%     | 1.61%    | 17.55%       |
| A              | 1.98%      | 4.32%     | 62.53%   | 6.40%      | 3.18%     | 1.88%    | 19.72%       |
| Baa            | 0.78%      | 0.87%     | 3.16%    | 60.91%     | 5.30%     | 4.85%    | 24.13%       |
| Ba             | 0.06%      | 0.17%     | 1.04%    | 3.26%      | 57.53%    | 5.04%    | 32.91%       |
| B              | 0.17%      | 0.06%     | 0.17%    | 0.58%      | 5.18%     | 76.61%   | 17.22%       |
| Caa-C          | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 1.05%     | 0.00%    | 98.95%       |
| <b>5-year</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
| Aaa            | 94.30%     | 2.50%     | 1.42%    | 0.71%      | 0.32%     | 0.30%    | 0.44%        |
| Aa             | 20.53%     | 64.03%    | 6.30%    | 3.97%      | 1.60%     | 0.95%    | 2.62%        |
| A              | 5.48%      | 11.19%    | 63.49%   | 8.07%      | 4.42%     | 1.89%    | 5.46%        |
| Baa            | 2.11%      | 2.44%     | 8.03%    | 58.85%     | 7.95%     | 5.41%    | 15.21%       |
| Ba             | 0.49%      | 0.49%     | 2.88%    | 8.11%      | 62.99%    | 5.79%    | 19.25%       |
| B              | 0.43%      | 0.17%     | 0.43%    | 1.64%      | 7.83%     | 67.73%   | 21.77%       |
| Caa-C          | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 4.00%     | 2.00%    | 94.00%       |
| <b>7-year</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
| Aaa            | 96.75%     | 1.37%     | 0.63%    | 0.47%      | 0.17%     | 0.21%    | 0.40%        |
| Aa             | 31.34%     | 54.47%    | 4.97%    | 3.99%      | 1.23%     | 1.11%    | 2.89%        |
| A              | 9.81%      | 13.31%    | 59.56%   | 7.28%      | 3.79%     | 1.39%    | 4.87%        |
| Baa            | 3.73%      | 4.69%     | 11.52%   | 54.50%     | 6.18%     | 3.62%    | 15.75%       |
| Ba             | 0.71%      | 0.83%     | 4.53%    | 10.54%     | 57.06%    | 6.73%    | 19.59%       |
| B              | 0.55%      | 0.00%     | 0.41%    | 2.87%      | 8.47%     | 53.42%   | 34.29%       |
| Caa-C          | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 5.41%     | 5.41%    | 89.19%       |
| <b>10-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
| Aaa            | 96.85%     | 1.54%     | 0.67%    | 0.38%      | 0.18%     | 0.18%    | 0.21%        |
| Aa             | 37.52%     | 51.93%    | 4.59%    | 2.21%      | 0.42%     | 0.97%    | 2.35%        |
| A              | 12.70%     | 10.30%    | 68.15%   | 2.88%      | 0.90%     | 1.07%    | 3.99%        |
| Baa            | 10.79%     | 5.18%     | 9.97%    | 47.91%     | 3.25%     | 3.30%    | 19.60%       |
| Ba             | 2.65%      | 2.65%     | 7.50%    | 12.65%     | 48.24%    | 4.12%    | 22.21%       |
| B              | 0.56%      | 0.28%     | 1.69%    | 5.07%      | 5.35%     | 46.20%   | 40.85%       |
| Caa-C          | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 8.70%     | 8.70%    | 82.61%       |

**Figure 74 - Global Structured Finance excl SF CDOs, Other SF, and '05-'07 vintage US HEL & RMBS Rating Transition Matrices by Original Rating using Rating before WR (1984-2009)**

| <b>1-year</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
|----------------|------------|-----------|----------|------------|-----------|----------|--------------|
| Aaa            | 99.09%     | 0.49%     | 0.15%    | 0.12%      | 0.02%     | 0.05%    | 0.08%        |
| Aa             | 1.25%      | 96.97%    | 1.32%    | 0.20%      | 0.09%     | 0.02%    | 0.15%        |
| A              | 0.19%      | 0.78%     | 96.54%   | 1.74%      | 0.37%     | 0.11%    | 0.27%        |
| Baa            | 0.07%      | 0.04%     | 0.42%    | 97.75%     | 0.97%     | 0.42%    | 0.33%        |
| Ba             | 0.00%      | 0.02%     | 0.00%    | 0.57%      | 97.86%    | 0.76%    | 0.78%        |
| B              | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.84%     | 97.43%   | 1.73%        |
| Caa-C          | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 0.00%    | 100.00%      |
| <b>3-year</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
| Aaa            | 97.25%     | 1.30%     | 0.60%    | 0.36%      | 0.18%     | 0.20%    | 0.12%        |
| Aa             | 10.31%     | 79.38%    | 4.70%    | 2.42%      | 0.89%     | 0.50%    | 1.79%        |
| A              | 2.85%      | 6.00%     | 78.55%   | 6.29%      | 2.93%     | 0.99%    | 2.38%        |
| Baa            | 1.16%      | 1.24%     | 4.67%    | 79.54%     | 5.54%     | 4.33%    | 3.51%        |
| Ba             | 0.08%      | 0.24%     | 1.50%    | 4.58%      | 73.32%    | 6.00%    | 14.28%       |
| B              | 0.19%      | 0.06%     | 0.19%    | 0.62%      | 5.55%     | 77.69%   | 15.70%       |
| Caa-C          | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 1.06%     | 0.00%    | 98.94%       |
| <b>5-year</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
| Aaa            | 94.89%     | 2.39%     | 1.37%    | 0.66%      | 0.25%     | 0.23%    | 0.21%        |
| Aa             | 21.19%     | 64.69%    | 6.23%    | 4.00%      | 1.43%     | 0.82%    | 1.64%        |
| A              | 5.61%      | 11.33%    | 64.12%   | 8.16%      | 4.44%     | 1.91%    | 4.42%        |
| Baa            | 2.21%      | 2.47%     | 8.27%    | 59.83%     | 8.13%     | 5.42%    | 13.66%       |
| Ba             | 0.51%      | 0.51%     | 3.02%    | 8.29%      | 63.08%    | 5.77%    | 18.81%       |
| B              | 0.43%      | 0.17%     | 0.43%    | 1.65%      | 7.89%     | 67.56%   | 21.86%       |
| Caa-C          | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 4.00%     | 2.00%    | 94.00%       |
| <b>7-year</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
| Aaa            | 97.11%     | 1.27%     | 0.59%    | 0.43%      | 0.13%     | 0.19%    | 0.28%        |
| Aa             | 31.89%     | 54.59%    | 5.02%    | 4.01%      | 1.13%     | 1.08%    | 2.29%        |
| A              | 9.97%      | 13.21%    | 59.84%   | 7.29%      | 3.77%     | 1.42%    | 4.50%        |
| Baa            | 3.88%      | 4.79%     | 11.84%   | 55.21%     | 6.27%     | 3.66%    | 14.35%       |
| Ba             | 0.75%      | 0.87%     | 4.67%    | 10.78%     | 56.88%    | 6.73%    | 19.31%       |
| B              | 0.55%      | 0.00%     | 0.41%    | 2.90%      | 8.41%     | 53.24%   | 34.48%       |
| Caa-C          | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 5.41%     | 5.41%    | 89.19%       |
| <b>10-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
| Aaa            | 96.96%     | 1.48%     | 0.65%    | 0.39%      | 0.17%     | 0.18%    | 0.19%        |
| Aa             | 37.64%     | 51.76%    | 4.63%    | 2.23%      | 0.40%     | 0.97%    | 2.37%        |
| A              | 12.71%     | 10.17%    | 68.29%   | 2.84%      | 0.90%     | 1.08%    | 4.01%        |
| Baa            | 10.86%     | 5.21%     | 9.98%    | 47.84%     | 3.27%     | 3.33%    | 19.51%       |
| Ba             | 2.69%      | 2.69%     | 7.49%    | 12.87%     | 47.60%    | 4.19%    | 22.46%       |
| B              | 0.57%      | 0.29%     | 1.71%    | 5.14%      | 5.14%     | 46.00%   | 41.14%       |
| Caa-C          | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 8.70%     | 8.70%    | 82.61%       |

**Figure 75 - US ABS ex HEL Rating Transition Matrices by Original Rating using Rating before WR (1984-2009)**

| <b>1-year</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
|----------------|------------|-----------|----------|------------|-----------|----------|--------------|
| Aaa            | 98.26%     | 0.79%     | 0.41%    | 0.43%      | 0.01%     | 0.02%    | 0.08%        |
| Aa             | 0.69%      | 96.04%    | 1.60%    | 0.76%      | 0.23%     | 0.00%    | 0.69%        |
| A              | 0.09%      | 0.98%     | 95.10%   | 3.16%      | 0.28%     | 0.19%    | 0.19%        |
| Baa            | 0.00%      | 0.00%     | 0.28%    | 96.03%     | 1.95%     | 0.84%    | 0.91%        |
| Ba             | 0.00%      | 0.00%     | 0.00%    | 2.09%      | 93.38%    | 3.48%    | 1.05%        |
| B              | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 95.65%   | 4.35%        |
| Caa-C          | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 0.00%    | 100.00%      |
| <b>3-year</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
| Aaa            | 94.35%     | 2.12%     | 1.28%    | 0.88%      | 0.38%     | 0.69%    | 0.30%        |
| Aa             | 5.93%      | 77.73%    | 4.91%    | 7.45%      | 1.44%     | 0.08%    | 2.46%        |
| A              | 2.94%      | 6.29%     | 76.99%   | 9.12%      | 2.35%     | 0.79%    | 1.52%        |
| Baa            | 2.74%      | 2.38%     | 4.41%    | 75.73%     | 5.83%     | 3.62%    | 5.30%        |
| Ba             | 0.41%      | 0.82%     | 2.45%    | 5.71%      | 56.73%    | 8.57%    | 25.31%       |
| B              | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 61.54%   | 38.46%       |
| Caa-C          | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 0.00%    | 100.00%      |
| <b>5-year</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
| Aaa            | 94.20%     | 2.14%     | 1.56%    | 0.66%      | 0.33%     | 0.40%    | 0.71%        |
| Aa             | 7.05%      | 65.84%    | 6.16%    | 10.72%     | 1.89%     | 1.99%    | 6.36%        |
| A              | 3.72%      | 8.08%     | 71.70%   | 7.88%      | 3.92%     | 0.86%    | 3.84%        |
| Baa            | 4.02%      | 2.64%     | 4.94%    | 66.13%     | 6.77%     | 3.33%    | 12.17%       |
| Ba             | 0.53%      | 0.53%     | 2.11%    | 5.26%      | 46.32%    | 4.21%    | 41.05%       |
| B              | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 44.83%   | 55.17%       |
| Caa-C          | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 0.00%    | 100.00%      |
| <b>7-year</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
| Aaa            | 93.61%     | 1.71%     | 1.62%    | 0.78%      | 0.43%     | 0.75%    | 1.09%        |
| Aa             | 8.55%      | 56.27%    | 6.39%    | 12.53%     | 2.41%     | 3.73%    | 10.12%       |
| A              | 3.99%      | 7.65%     | 68.39%   | 9.50%      | 4.72%     | 0.63%    | 5.11%        |
| Baa            | 4.91%      | 2.08%     | 2.98%    | 59.08%     | 4.32%     | 2.98%    | 23.66%       |
| Ba             | 0.00%      | 0.65%     | 0.65%    | 1.95%      | 41.56%    | 2.60%    | 52.60%       |
| B              | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 42.86%   | 57.14%       |
| Caa-C          | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 0.00%    | 100.00%      |
| <b>10-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
| Aaa            | 93.14%     | 2.76%     | 1.46%    | 0.88%      | 0.75%     | 0.60%    | 0.42%        |
| Aa             | 13.41%     | 60.34%    | 7.08%    | 5.77%      | 0.93%     | 3.72%    | 8.75%        |
| A              | 4.08%      | 5.47%     | 82.81%   | 2.08%      | 0.43%     | 0.61%    | 4.51%        |
| Baa            | 4.10%      | 3.08%     | 4.10%    | 50.77%     | 3.08%     | 3.08%    | 31.79%       |
| Ba             | 0.00%      | 1.28%     | 1.28%    | 0.00%      | 46.15%    | 0.00%    | 51.28%       |
| B              | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 55.56%   | 44.44%       |
| Caa-C          |            |           |          |            |           |          |              |

**Figure 76 - US HEL Rating Transition Matrices by Original Rating using Rating before WR (1989-2009)**

| <b>1-year</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
|----------------|------------|-----------|----------|------------|-----------|----------|--------------|
| Aaa            | 97.78%     | 0.97%     | 0.55%    | 0.44%      | 0.14%     | 0.10%    | 0.01%        |
| Aa             | 0.08%      | 90.86%    | 1.54%    | 1.77%      | 1.89%     | 3.18%    | 0.68%        |
| A              | 0.00%      | 0.04%     | 81.83%   | 4.50%      | 4.08%     | 5.77%    | 3.79%        |
| Baa            | 0.00%      | 0.00%     | 0.03%    | 81.41%     | 2.67%     | 4.31%    | 11.57%       |
| Ba             | 0.00%      | 0.00%     | 0.00%    | 0.07%      | 74.54%    | 3.41%    | 21.98%       |
| B              | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 100.00%  | 0.00%        |
| Caa-C          | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 0.00%    | 100.00%      |
| <b>3-year</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
| Aaa            | 86.97%     | 1.43%     | 1.19%    | 1.44%      | 1.70%     | 2.59%    | 4.68%        |
| Aa             | 1.92%      | 61.04%    | 3.25%    | 2.04%      | 2.04%     | 2.21%    | 27.50%       |
| A              | 0.24%      | 1.68%     | 53.67%   | 6.45%      | 2.58%     | 1.97%    | 33.41%       |
| Baa            | 0.06%      | 0.11%     | 1.15%    | 49.99%     | 5.31%     | 4.77%    | 38.61%       |
| Ba             | 0.00%      | 0.00%     | 0.00%    | 0.38%      | 27.13%    | 4.04%    | 68.45%       |
| B              | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 63.24%   | 36.76%       |
| Caa-C          | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 0.00%    | 100.00%      |
| <b>5-year</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
| Aaa            | 96.90%     | 1.11%     | 0.39%    | 0.52%      | 0.25%     | 0.48%    | 0.35%        |
| Aa             | 10.75%     | 76.39%    | 7.80%    | 3.74%      | 0.52%     | 0.26%    | 0.52%        |
| A              | 1.08%      | 9.18%     | 60.06%   | 15.64%     | 6.57%     | 3.40%    | 4.08%        |
| Baa            | 0.17%      | 0.56%     | 3.49%    | 48.10%     | 12.67%    | 9.91%    | 25.09%       |
| Ba             | 0.00%      | 0.71%     | 0.00%    | 3.18%      | 41.34%    | 8.13%    | 46.64%       |
| B              | 0.00%      | 0.00%     | 1.85%    | 0.00%      | 5.56%     | 42.59%   | 50.00%       |
| Caa-C          |            |           |          |            |           |          |              |
| <b>7-year</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
| Aaa            | 97.05%     | 0.92%     | 0.42%    | 1.07%      | 0.09%     | 0.10%    | 0.35%        |
| Aa             | 12.62%     | 65.69%    | 9.69%    | 7.85%      | 1.38%     | 0.92%    | 1.85%        |
| A              | 3.75%      | 10.44%    | 55.95%   | 12.23%     | 5.38%     | 4.73%    | 7.50%        |
| Baa            | 0.27%      | 0.95%     | 5.14%    | 49.93%     | 7.31%     | 4.87%    | 31.53%       |
| Ba             | 0.84%      | 0.84%     | 0.84%    | 6.72%      | 51.26%    | 7.56%    | 31.93%       |
| B              | 2.04%      | 0.00%     | 0.00%    | 2.04%      | 6.12%     | 20.41%   | 69.39%       |
| Caa-C          |            |           |          |            |           |          |              |
| <b>10-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
| Aaa            | 96.42%     | 1.13%     | 1.05%    | 0.63%      | 0.00%     | 0.29%    | 0.47%        |
| Aa             | 15.02%     | 65.93%    | 8.06%    | 5.49%      | 0.73%     | 0.37%    | 4.40%        |
| A              | 5.48%      | 12.79%    | 64.84%   | 8.22%      | 0.91%     | 1.83%    | 5.94%        |
| Baa            | 0.37%      | 1.87%     | 5.62%    | 48.31%     | 6.74%     | 4.87%    | 32.21%       |
| Ba             | 3.17%      | 0.00%     | 1.59%    | 4.76%      | 39.68%    | 7.94%    | 42.86%       |
| B              | 2.13%      | 2.13%     | 0.00%    | 2.13%      | 4.26%     | 12.77%   | 76.60%       |
| Caa-C          |            |           |          |            |           |          |              |

**Figure 77 - US RMBS Rating Transition Matrices by Original Rating using Rating before WR (1984-2009)**

| <b>1-year</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
|----------------|------------|-----------|----------|------------|-----------|----------|--------------|
| Aaa            | 99.31%     | 0.26%     | 0.16%    | 0.07%      | 0.06%     | 0.07%    | 0.07%        |
| Aa             | 1.04%      | 94.26%    | 1.08%    | 0.56%      | 0.54%     | 2.22%    | 0.30%        |
| A              | 0.11%      | 0.31%     | 85.45%   | 4.96%      | 2.01%     | 4.43%    | 2.73%        |
| Baa            | 0.03%      | 0.00%     | 0.28%    | 84.50%     | 4.01%     | 4.40%    | 6.77%        |
| Ba             | 0.00%      | 0.00%     | 0.00%    | 0.74%      | 90.41%    | 2.95%    | 5.90%        |
| B              | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.80%     | 95.37%   | 3.82%        |
| Caa-C          | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 0.00%    | 100.00%      |
| <b>3-year</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
| Aaa            | 83.36%     | 1.53%     | 1.20%    | 1.05%      | 1.41%     | 2.87%    | 8.58%        |
| Aa             | 10.00%     | 61.95%    | 3.78%    | 1.83%      | 1.08%     | 1.57%    | 19.79%       |
| A              | 2.26%      | 6.64%     | 51.49%   | 1.98%      | 2.12%     | 2.92%    | 32.59%       |
| Baa            | 0.27%      | 1.58%     | 6.48%    | 52.62%     | 1.51%     | 3.33%    | 34.20%       |
| Ba             | 0.00%      | 0.31%     | 3.91%    | 10.60%     | 60.70%    | 0.62%    | 23.87%       |
| B              | 0.00%      | 0.00%     | 0.43%    | 0.86%      | 15.63%    | 74.30%   | 8.78%        |
| Caa-C          | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 0.00%    | 100.00%      |
| <b>5-year</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
| Aaa            | 94.37%     | 2.87%     | 1.78%    | 0.72%      | 0.16%     | 0.10%    | 0.00%        |
| Aa             | 28.98%     | 59.64%    | 5.57%    | 3.03%      | 1.41%     | 0.63%    | 0.73%        |
| A              | 9.76%      | 18.03%    | 51.13%   | 5.93%      | 4.06%     | 3.36%    | 7.73%        |
| Baa            | 2.48%      | 6.04%     | 15.94%   | 55.03%     | 3.64%     | 2.94%    | 13.93%       |
| Ba             | 0.85%      | 0.34%     | 9.64%    | 18.95%     | 54.48%    | 1.69%    | 14.04%       |
| B              | 0.57%      | 0.29%     | 0.57%    | 3.14%      | 20.57%    | 59.71%   | 15.14%       |
| Caa-C          | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 100.00%   | 0.00%    | 0.00%        |
| <b>7-year</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
| Aaa            | 98.75%     | 0.90%     | 0.22%    | 0.09%      | 0.01%     | 0.01%    | 0.01%        |
| Aa             | 42.74%     | 50.71%    | 3.63%    | 1.32%      | 0.32%     | 0.61%    | 0.67%        |
| A              | 18.05%     | 21.72%    | 50.35%   | 2.96%      | 1.55%     | 1.27%    | 4.09%        |
| Baa            | 5.47%      | 8.54%     | 18.69%   | 57.14%     | 3.34%     | 1.87%    | 4.94%        |
| Ba             | 0.81%      | 0.81%     | 14.52%   | 20.43%     | 53.23%    | 2.15%    | 8.06%        |
| B              | 0.50%      | 0.00%     | 0.00%    | 5.00%      | 19.50%    | 63.50%   | 11.50%       |
| Caa-C          | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 100.00%   | 0.00%    | 0.00%        |
| <b>10-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
| Aaa            | 98.78%     | 0.93%     | 0.14%    | 0.12%      | 0.00%     | 0.00%    | 0.03%        |
| Aa             | 45.08%     | 48.96%    | 3.70%    | 0.83%      | 0.22%     | 0.47%    | 0.75%        |
| A              | 20.78%     | 20.00%    | 53.51%   | 1.82%      | 0.78%     | 0.26%    | 2.86%        |
| Baa            | 6.61%      | 6.61%     | 18.22%   | 61.96%     | 0.91%     | 1.82%    | 3.87%        |
| Ba             | 1.29%      | 2.15%     | 9.87%    | 21.03%     | 59.66%    | 1.29%    | 4.72%        |
| B              | 0.97%      | 0.00%     | 0.97%    | 6.80%      | 2.91%     | 82.52%   | 5.83%        |
| Caa-C          | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 100.00%   | 0.00%    | 0.00%        |

**Figure 78 - US CMBS Rating Transition Matrices by Original Rating using Rating before WR (1987-2009)**

| <b>1-year</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
|----------------|------------|-----------|----------|------------|-----------|----------|--------------|
| Aaa            | 99.14%     | 0.61%     | 0.22%    | 0.00%      | 0.02%     | 0.00%    | 0.00%        |
| Aa             | 1.80%      | 96.14%    | 1.42%    | 0.52%      | 0.13%     | 0.00%    | 0.00%        |
| A              | 0.24%      | 0.84%     | 95.63%   | 2.03%      | 1.08%     | 0.12%    | 0.06%        |
| Baa            | 0.00%      | 0.08%     | 0.51%    | 97.35%     | 1.11%     | 0.83%    | 0.12%        |
| Ba             | 0.00%      | 0.00%     | 0.00%    | 0.43%      | 98.00%    | 0.36%    | 1.22%        |
| B              | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.09%     | 97.81%   | 2.09%        |
| Caa-C          | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 0.00%     | 0.00%    | 100.00%      |
| <b>3-year</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
| Aaa            | 95.22%     | 2.22%     | 1.61%    | 0.49%      | 0.37%     | 0.06%    | 0.03%        |
| Aa             | 17.32%     | 66.15%    | 8.42%    | 4.13%      | 1.64%     | 1.87%    | 0.47%        |
| A              | 5.05%      | 7.17%     | 67.64%   | 9.30%      | 5.49%     | 1.98%    | 3.37%        |
| Baa            | 1.88%      | 1.41%     | 4.99%    | 72.73%     | 8.43%     | 6.64%    | 3.91%        |
| Ba             | 0.09%      | 0.09%     | 0.87%    | 2.08%      | 76.84%    | 4.94%    | 15.09%       |
| B              | 0.33%      | 0.11%     | 0.11%    | 0.44%      | 0.88%     | 78.76%   | 19.36%       |
| Caa-C          | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 3.03%     | 0.00%    | 96.97%       |
| <b>5-year</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
| Aaa            | 98.20%     | 1.49%     | 0.26%    | 0.00%      | 0.00%     | 0.05%    | 0.00%        |
| Aa             | 42.99%     | 52.22%    | 1.92%    | 1.20%      | 0.72%     | 0.36%    | 0.60%        |
| A              | 14.12%     | 21.81%    | 56.61%   | 3.95%      | 2.94%     | 0.45%    | 0.11%        |
| Baa            | 5.07%      | 4.12%     | 13.24%   | 68.52%     | 6.51%     | 1.59%    | 0.94%        |
| Ba             | 0.57%      | 0.85%     | 1.71%    | 6.54%      | 78.66%    | 8.82%    | 2.84%        |
| B              | 0.51%      | 0.17%     | 0.17%    | 1.01%      | 2.69%     | 76.60%   | 18.86%       |
| Caa-C          | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 3.13%     | 3.13%    | 93.75%       |
| <b>7-year</b>  | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
| Aaa            | 97.59%     | 1.75%     | 0.50%    | 0.08%      | 0.00%     | 0.08%    | 0.00%        |
| Aa             | 59.11%     | 35.18%    | 2.14%    | 1.07%      | 1.07%     | 0.54%    | 0.89%        |
| A              | 34.92%     | 29.63%    | 27.51%   | 3.70%      | 2.82%     | 0.18%    | 1.23%        |
| Baa            | 7.69%      | 10.66%    | 21.54%   | 50.11%     | 5.93%     | 2.20%    | 1.87%        |
| Ba             | 0.97%      | 1.93%     | 3.38%    | 13.29%     | 63.53%    | 11.59%   | 5.31%        |
| B              | 0.54%      | 0.00%     | 0.54%    | 2.44%      | 5.15%     | 54.20%   | 37.13%       |
| Caa-C          | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 3.45%     | 6.90%    | 89.66%       |
| <b>10-year</b> | <b>Aaa</b> | <b>Aa</b> | <b>A</b> | <b>Baa</b> | <b>Ba</b> | <b>B</b> | <b>Caa-C</b> |
| Aaa            | 97.81%     | 0.91%     | 1.09%    | 0.18%      | 0.00%     | 0.00%    | 0.00%        |
| Aa             | 55.45%     | 37.82%    | 1.60%    | 2.56%      | 0.00%     | 0.96%    | 1.60%        |
| A              | 60.43%     | 11.74%    | 22.17%   | 1.74%      | 1.74%     | 0.00%    | 2.17%        |
| Baa            | 45.66%     | 12.54%    | 12.54%   | 22.83%     | 0.64%     | 1.61%    | 4.18%        |
| Ba             | 9.63%      | 8.89%     | 17.04%   | 15.56%     | 34.07%    | 8.15%    | 6.67%        |
| B              | 0.00%      | 0.00%     | 3.79%    | 6.82%      | 9.85%     | 33.33%   | 46.21%       |
| Caa-C          | 0.00%      | 0.00%     | 0.00%    | 0.00%      | 5.56%     | 11.11%   | 83.33%       |





## Moody's Related Research

### Special Comments:

- » Structured Finance Rating Transitions: 1983-2008, March 2009 (115157)
- » EMEA Structured Finance Rating Transitions: 1988-2008, April 2009 (116507)
- » Japanese Structured Finance Rating Transitions: 1994-2008, March 2009 (115070)
- » Asia Pacific (ex-Japan) Structured Finance Rating Transitions: 1990-2008, March 2009 (115165)
- » Default & Loss Rates of Structured Finance Securities: 1993-2008, August 2009 (119617)
- » Measuring Loss-Given-Default for Structured Finance Securities: An Update, December 2006 (101284)
- » The Performance of Structured Finance Ratings: Mid-Year 2009 Report, December 2009 (121626)
- » Guide to Moody's Default Research: October 2009 Update, October 2009 (120969)

### Special Reports:

- » Rating Changes in the U.S. Asset-Backed Securities Market: 2009 Fourth Quarter Update, January 26, 2010 (SF192117)
- » Rating Changes in the U.S. Residential Mortgage-Backed Securities Market: 2009 Fourth Quarter Update, January 29, 2010 (SF191940)
- » 2009 Review and 2010 Outlook: ABS Surveillance, January 29, 2010 (SF192118)
- » 2009 Review and 2010 Outlook: U.S. RMBS Surveillance, January 27, 2010 (SF192366)
- » 2009 Review and 2010 Outlook: US CMBS and CRE CDO, February 10, 2010 (SF193650)
- » Structured Finance CDO Ratings Surveillance Brief - Fourth Quarter 2009, February 9, 2010 (SF193363)
- » Corporate Collateralized Synthetic Obligation Ratings Surveillance Brief - Fourth Quarter 2009, January 29, 2010 (SF192133)
- » CLO Ratings Surveillance Brief - Third Quarter 2009, October 30, 2009 (SF183617)

To access any of these reports, click on the entry above. Note that these references are current as of the date of publication of this report and that more recent reports may be available. All research may not be available to all clients.

---

Report Number: 123474

Author  
Julia Tung

Production Associate  
Judy Yuen

© 2010 Moody's Investors Service, Inc. and/or its licensors and affiliates (collectively, "MOODY'S"). All rights reserved.

**CREDIT RATINGS ARE MOODY'S INVESTORS SERVICE, INC.'S ("MIS") CURRENT OPINIONS OF THE RELATIVE FUTURE CREDIT RISK OF ENTITIES, CREDIT COMMITMENTS, OR DEBT OR DEBT-LIKE SECURITIES. MIS DEFINES CREDIT RISK AS THE RISK THAT AN ENTITY MAY NOT MEET ITS CONTRACTUAL, FINANCIAL OBLIGATIONS AS THEY COME DUE AND ANY ESTIMATED FINANCIAL LOSS IN THE EVENT OF DEFAULT. CREDIT RATINGS DO NOT ADDRESS ANY OTHER RISK, INCLUDING BUT NOT LIMITED TO: LIQUIDITY RISK, MARKET VALUE RISK, OR PRICE VOLATILITY. CREDIT RATINGS ARE NOT STATEMENTS OF CURRENT OR HISTORICAL FACT. CREDIT RATINGS DO NOT CONSTITUTE INVESTMENT OR FINANCIAL ADVICE, AND CREDIT RATINGS ARE NOT RECOMMENDATIONS TO PURCHASE, SELL, OR HOLD PARTICULAR SECURITIES. CREDIT RATINGS DO NOT COMMENT ON THE SUITABILITY OF AN INVESTMENT FOR ANY PARTICULAR INVESTOR. MIS ISSUES ITS CREDIT RATINGS WITH THE EXPECTATION AND UNDERSTANDING THAT EACH INVESTOR WILL MAKE ITS OWN STUDY AND EVALUATION OF EACH SECURITY THAT IS UNDER CONSIDERATION FOR PURCHASE, HOLDING, OR SALE.**

ALL INFORMATION CONTAINED HEREIN IS PROTECTED BY LAW, INCLUDING BUT NOT LIMITED TO, COPYRIGHT LAW, AND NONE OF SUCH INFORMATION MAY BE COPIED OR OTHERWISE REPRODUCED, REPACKAGED, FURTHER TRANSMITTED, TRANSFERRED, DISSEMINATED, REDISTRIBUTED OR RESOLD, OR STORED FOR SUBSEQUENT USE FOR ANY SUCH PURPOSE, IN WHOLE OR IN PART, IN ANY FORM OR MANNER OR BY ANY MEANS WHATSOEVER, BY ANY PERSON WITHOUT MOODY'S PRIOR WRITTEN CONSENT. All information contained herein is obtained by MOODY'S from sources believed by it to be accurate and reliable. Because of the possibility of human or mechanical error as well as other factors, however, all information contained herein is provided "AS IS" without warranty of any kind. Under no circumstances shall MOODY'S have any liability to any person or entity for (a) any loss or damage in whole or in part caused by, resulting from, or relating to, any error (negligent or otherwise) or other circumstance or contingency within or outside the control of MOODY'S or any of its directors, officers, employees or agents in connection with the procurement, collection, compilation, analysis, interpretation, communication, publication or delivery of any such information, or (b) any direct, indirect, special, consequential, compensatory or incidental damages whatsoever (including without limitation, lost profits), even if MOODY'S is advised in advance of the possibility of such damages, resulting from the use of or inability to use, any such information. The ratings, financial reporting analysis, projections, and other observations, if any, constituting part of the information contained herein are, and must be construed solely as, statements of opinion and not statements of fact or recommendations to purchase, sell or hold any securities. Each user of the information contained herein must make its own study and evaluation of each security it may consider purchasing, holding or selling. NO WARRANTY, EXPRESS OR IMPLIED, AS TO THE ACCURACY, TIMELINESS, COMPLETENESS, MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OF ANY SUCH RATING OR OTHER OPINION OR INFORMATION IS GIVEN OR MADE BY MOODY'S IN ANY FORM OR MANNER WHATSOEVER.

MIS, a wholly-owned credit rating agency subsidiary of Moody's Corporation ("MCO"), hereby discloses that most issuers of debt securities (including corporate and municipal bonds, debentures, notes and commercial paper) and preferred stock rated by MIS have, prior to assignment of any rating, agreed to pay to MIS for appraisal and rating services rendered by it fees ranging from \$1,500 to approximately \$2,500,000. MCO and MIS also maintain policies and procedures to address the independence of MIS's ratings and rating processes. Information regarding certain affiliations that may exist between directors of MCO and rated entities, and between entities who hold ratings from MIS and have also publicly reported to the SEC an ownership interest in MCO of more than 5%, is posted annually at [www.moody's.com](http://www.moody's.com) under the heading "Shareholder Relations — Corporate Governance — Director and Shareholder Affiliation Policy."

Any publication into Australia of this Document is by Moody's affiliate Moody's Investors Service Pty Limited ABN 61 003 399 657, which holds Australian Financial Services License no. 336969. This document is intended to be provided only to wholesale clients (within the meaning of section 761G of the Corporations Act 2001). By continuing to access this Document from within Australia, you represent to Moody's and its affiliates that you are, or are accessing the Document as a representative of, a wholesale client and that neither you nor the entity you represent will directly or indirectly disseminate this Document or its contents to retail clients (within the meaning of section 761G of the Corporations Act 2001).

Contact

Phone

New York

Jian Hu  
Richard Cantor  
Andrew Silver  
Tad Phillip  
Joseph Snailer

1.212.553.1653

## Payment Defaults And Material Impairments Of U.S. Structured Finance Securities: 1993-2002

### Summary

Moody's structured ratings are assigned on the basis of expected loss, which is the product of the frequency of default and losses in the event of default. While the likelihood of default alone does not determine a rating, it is a critical component of the measurement of expected loss.

This is the first study of defaults on Moody's-rated structured finance securities. Some initial findings on loss severity given default are reported as well. Highlights of this special comment include:

- A structured security is defined as being:
  - *In payment default* if it suffers an interest shortfall or principal writedown.
  - *Materially impaired* if it has defaulted and its default has not been cured, or if it has not yet defaulted but was assigned a Ca or C rating.
- For the period of the study (1993-2002) Moody's assigned initial ratings to 13,419 U.S. asset-backed securities (ABS), commercial mortgage-backed securities (CMBS) and residential mortgage-backed securities (RMBS). Of these, 390 or 2.91% sustained payment defaults. By July of 2003, 94 of these defaults had been cured, leaving 296 uncured defaults. Of the universe of 168 Ca or C rated securities, 30 had not yet defaulted. Therefore, a total of 326 securities or 2.43% were materially impaired during the study period.
- The largest number of materially impaired securities came from the ABS sector with 174 material impairments. This is followed by the RMBS sector with 121 material impairments. The CMBS sector had the least material impairments with 31. The ABS sector also sustained the highest material impairment rate while the CMBS sector had the lowest.
- Highly rated structured securities have sustained low payment default rates and low material impairment rates. Moody's structured finance ratings have effectively rank ordered the risk of payment default and material impairment over both short- and long-term horizons.
- In the event of default, securities that carried high initial ratings have generally suffered low loss rates; whereas, those that carried low initial rating often suffered substantial rates of loss. Moody's structured finance ratings have effectively rank ordered loss severity rates.
- Investment-grade material impairment rates for structured securities are, on average, similar to those of corporate securities when measured by vintage, but are higher when measured by seasoned cohorts formed at the beginning of each year. Moreover, loss severity on defaulted investment-grade securities tends to be lower for structured than for corporate securities. Speculative-grade material impairment rates have been markedly lower for structured than for corporate securities.
- Although final loss estimates are not yet available for many securities in default, they are available for 84 defaulted securities that have zero outstanding balances. The average loss severity rate for these securities, when measured as a percentage of their original balances, is 42% with a large standard deviation of 33%. Unlike many other defaulting securities, most of these securities had their balances written down sharply. Therefore, their average loss experience has likely been more severe than the ultimate final loss rates on those defaulted securities that currently carry positive balances.

**Figure 1 - Payment Default And Material Impairment Rates On U.S. Structured Securities, 1994-2002**

|                   | One-Year                 |      |      |      |                              |      |      |      | Five-Year                |      |      |      |                              |      |      |      |
|-------------------|--------------------------|------|------|------|------------------------------|------|------|------|--------------------------|------|------|------|------------------------------|------|------|------|
|                   | Payment Default Rate (%) |      |      |      | Material Impairment Rate (%) |      |      |      | Payment Default Rate (%) |      |      |      | Material Impairment Rate (%) |      |      |      |
|                   | ALL                      | ABS  | CMBS | RMBS | ALL                          | ABS  | CMBS | RMBS | ALL                      | ABS  | CMBS | RMBS | ALL                          | ABS  | CMBS | RMBS |
| Investment Grade  | 0.4                      | 0.4  | 0.5  | 0.4  | 0.3                          | 0.4  | 0.2  | 0.3  | 3.2                      | 3.6  | 2.9  | 3.1  | 2.5                          | 3.3  | 1.0  | 2.2  |
| Speculative Grade | 5.9                      | 11.7 | 4.6  | 4.2  | 5.0                          | 12.4 | 1.9  | 4.0  | 23.3                     | 52.8 | 28.1 | 13.8 | 19.2                         | 53.7 | 12.1 | 12.5 |

# Table of Contents

|  |    |
|--|----|
| Summary .....  | 1  |
| Overview .....   | 3  |
| Definitions of Payment Default and Material Impairment .....   | 3  |
| Data Sample And Distribution Of Ratings .....  | 4  |
| Distribution Of Defaults By Sector, Initial Default Event, And Cure Status .....                             | 5  |
| Distribution Of Payment Defaults By Sector .....   | 5  |
| Distribution Of Payment Default By Initial Default Event .....   | 5  |
| Distribution Of Payment Default By Cure Status .....   | 6  |
| Distribution Of Ca/C Rated Securities .....  | 7  |
| Relationship Between Payment Default And Ca/C Rating and Material Impairment .....                           | 7  |
| One-Year Payment Default Rates And Material Impairment Rates .....   | 8  |
| One-Year Default Rates By Type Of Default And Cohort Rating .....  | 10 |
| One-Year Payment Default And Material Impairment Rates .....   | 10 |
| Default Rates For Different Types Of Default .....   | 10 |
| Multi-Year Material Impairments Rates By Cohort And Original Rating .....                                    | 11 |
| Multi-Year Material Impairment Rate By Cohort Rating .....   | 11 |
| Multi-Year Material Impairment Rate By Original Rating .....   | 12 |
| The Seasoning Pattern In Marginal Material Impairment Rate .....   | 12 |
| Material Impairment Rate by Vintage .....  | 13 |
| Material Impairment Rates By Sector .....  | 13 |
| Material Impairment Rates In ABS .....   | 14 |
| Material Impairment Rates In CMBS .....  | 15 |
| Material Impairment Rates In RMBS .....  | 16 |
| Material Impairment Rates On Structured And Corporate Ratings .....  | 17 |
| Loss Severity Rates Of Payment Defaults .....  | 18 |
| Loss Severity Rates Of Payment Defaults That Had Zero Outstanding Balances .....                             | 19 |
| Loss Severity Rates To Date Of All Payment Defaults By Sector .....  | 19 |
| Loss Severity Rates By Original Rating .....   | 20 |
| Concluding Remarks .....   | 21 |
| Appendix I: Number Of Defaults, Impairments And Outstanding Rating Observations From 1993 To 2002 .....      | 22 |
| Appendix II: Material Impairment Rates By Rating And Sector .....  | 25 |
| Appendix III: Payment Default Rates By Rating And Sector .....   | 27 |
| Appendix IV: Default Rates and Impairment Rates Without Collapsing Same-Rated Tranches .....                 | 29 |
| Appendix V: Comparing Material Impairment Rates Between Structured And Corporate Sectors .....               | 32 |
| Appendix VI: Lists Of U.S. ABS, CMBS And RMBS Payment Defaults And Ca Or C Rated Securities, 1993-2002 ..... | 33 |
| Related Research .....   | 46 |

## Overview

---

Moody's structured finance ratings rank the credit quality of individual securities with respect to expected loss, which is the product of the probability of default and expected loss severity in the event of default. Default risk alone, therefore, does not determine a rating; however, it is obviously a critical factor.

This *Special Comment* provides an extensive review of the incidence of default in the U.S. structured finance market by cohort rating, original rating, time horizon, and sectors. The results present here on loss severity given default, however, are preliminary. A comprehensive review of the performance of Moody's structured finance ratings with respect to realized loss rates will be presented in a subsequent study.

## Definitions of Payment Default and Material Impairment

---

Structured securities are issued by special-purpose-entities (SPEs) whose activities are limited to selling securities, buying assets, and distributing the assets' cash flows to its security holders. An SPE is limited in its purpose and structured to be bankruptcy remote. The performance of its securities is determined almost entirely by the performance of the underlying collateral pool and by the covenanted direction of cash flows to each security.<sup>1</sup>

Despite being positioned for bankruptcy remoteness, the securities issued by an SPE can default. These securities, like other debt, typically have an explicit principal balance, a promise to pay periodic interest, and a promise to pay principal back to investors on or before an explicit final maturity date.<sup>2</sup> Any tranche that has not paid its promised interest and principal in entirety *by its final maturity date* is unambiguously in default.

Defining payment default prior to the final maturity date, however, can be complicated. Each securitization's prospectus generally provides a technical definition of default. Some prospectuses, however, anticipate that interest and principal due in a given period can under certain circumstances be deferred to later periods. Sometimes payment shortfalls are capitalized and hence one-time shortfalls can be made up to investors gradually over the remaining life of the transaction. Sometimes one-time shortfalls are due in full at the beginning of the next payment period. Sometimes payment deferrals require interest on interest, and sometimes they do not.<sup>3</sup>

Moody's structured ratings primarily address a security's lifetime expected loss rate. As a result, ratings performance may not be inferred as well from defaults – which may or may not be cured before the final maturity date – as from material impairments, securities that are virtually certain to have accumulated permanent interest or principal losses on their final maturity date.

Some of Moody's structured ratings also address the timeliness of payment. However, the definition of timeliness of payment varies not only from sector to sector and at time from transaction to transaction within sectors based on the explicit promises stated in the securitizations' prospectuses.

In this study, we adopt a single definition of payment default that can be applied to all securities. This definition is based on payment shortfall information as recorded in periodic servicer reports, which are commonly available to investors. In some cases, this definition does not conform to the definition of timely payment specifically addressed by Moody's rating or to the concept of default explicitly defined in the deal underlying documentation of certain transactions.

Even for securitizations that allow for the deferral of promised interest and principal, many investors have a reasonable expectation of timely payment of interest. The definition of default used in this study identifies the initial date of default as the first payment period (typically first month) in which investors receive less than they would be entitled if the assets underlying the transaction had performed well from a credit perspective.

If these shortfalls continue unabated for many months, the security will clearly suffer payment shortfalls and default at its final maturity date. However, any effort to be more precise than for many months would be quite arbitrary.

A structured security is therefore defined as being in payment default if it has suffered:

- an interest shortfall (excluding prepayment interest shortfalls<sup>4</sup>), or
- a principal write-down.<sup>5</sup>

---

1. When external credit enhancement is employed in a transaction, the risk of default on the part of the credit enhancer also may have material impact on the overall risk of the transaction. In addition, collateral performance can be affected by the financial condition of the originator or the servicer.

2. This discussion does not extend to the junior-most, unrated equity tranche, which is a residual claimant to the securitization's cash flows.

3. Credit events in structured transactions are further discussed in "Moody's Approach to Rating Synthetic Resecuritizations," *Moody's Structured Finance Special Report*, October 2003.

4. Prepayment interest shortfalls are losses of interest attributable to prepayments made before the end of a month. When a borrower prepays, interest is paid only until the prepayment date. The remaining interest for the month would be lost. Most servicers pay compensating interest to cover this type of interest shortfall, but only up to a specified percentage of the servicing fee received in the given month. The amount available to pay interest can also be reduced by application of the Soldiers' and Sailors' Civil Relief Act of 1940, as amended, or comparable state legislation, that permits a reduction of the interest on consumer debt for military personnel. These types of shortfall are not reimbursable by the servicer and are allocated pro-rata among all certificate holders. In addition, SSCRA of 1940 application is not limited to mortgages. These interest shortfalls are not considered to be payment defaults either.

5. Once written down, principal balances are almost never written back up. Moreover, when principal balances are written down, the balance against which future interest payments are calculated is typically reduced. Hence, in those instances, principal write-downs lead to permanent losses of interest, even if the write-down itself is later reversed. Not all asset types have write-down provisions. For these asset types, principal shortfalls may occur prior to maturity, but may not be realized. Our definition of payment defaults covers loss events explicitly reported in servicing reports, and those principal shortfalls that are not realized are not considered to be payment defaults.

Payment default rates, however, may be poor proxies for expected loss rates, both because many payment defaults will be eventually cured and will not impose permanent losses and because securitizations often experience sufficiently poor collateral performance that losses at final maturity are certain even though no payment shortfalls have not yet materialized.

In the former case, Moody's may in fact maintain a high rating on a security in default during the security's cure period. In the latter case, Moody's will generally assign a low rating despite the absence of a current default. For example, securities rated in the two lowest rating categories, Ca and C, are virtually certain to sustain substantial losses at maturity even if they are not yet in default.

For these reasons, we define a security to be materially impaired if it has:

- sustained a payment default that has not been cured, or
- been rated Ca or C and hence is expected to suffer a significant level of payment losses in the future.

## Data Sample And Distribution Of Ratings

---

The objective of this study is to discuss various types of structured-finance defaults and provide statistical analysis of default incidence across different long-term rating categories and across sectors. We have adopted six criteria to select rating observations for this study:

1. Our sample covers a 10-year period from 1993 to 2002. To be part of the sample, a security must have been assigned its initial rating or had its first payment some time after the start of 1993 and before the end of 2002. Defaults are measured between 1993 and 2002, and the cure status (to be defined later) of default is updated through July 2003.
2. The sample is drawn from the ABS, CMBS, and RMBS sectors. Asset-backed commercial paper (ABCP), collateralized debt obligations (CDO),<sup>6</sup> credit derivatives, structured notes, and securities wrapped by financial guaranty insurers or guaranteed by federal agencies or government sponsored enterprises (GSEs) are excluded.<sup>7</sup>
3. Single-tranche deals whose ratings are effectively pass-through of the credit risk of single corporate or sovereign issuers are excluded.
4. Tranches carrying the same rating in the same deal are collapsed into a single tranche. In such cases, the longest outstanding tranche is selected.<sup>8</sup>
5. IO (interest-only) and residual tranches are excluded.
6. Only U.S. structured securities are included.<sup>9</sup>

Based on these six criteria, the sample consists of 13,419 structured securities from 4,288 transactions. Of these securities, 6,522 are ABS, 2,614 are CMBS, and 4,283 are RMBS securities. Home-equity-loan (HEL) transactions are defined to be part of the ABS sector.<sup>10</sup> The number of outstanding securities at the beginning of each year is shown in Figure 2 by broad rating category and in Figure 3 by sector. Because we only include ratings assigned after January 1, 1993, Figures 2 and 3 do not have a 1993 column.

---

6. CDO tranches have not been included in this study because it is difficult to obtain detailed tranche-level payment information for all securities in this asset class. CDO defaults will be addressed in a future study.

7. Guaranteed securities have been excluded because they would skew the default rate statistics: they have all been very highly rated, often as Aaa; no security that has been guaranteed and highly rated by Moody's has ever defaulted; these financial guarantors do not originate or service structured transactions. We did not exclude tranches guaranteed by the originators of the assets, such as those guaranteed by Green Tree/Conseco.

8. We collapsed like-rated tranches in order to avoid placing undue weight on a few securitizations that have many pari passu tranches in our estimates of default and material impairment rates. By construction, pari passu tranches have perfectly correlated default and loss experience, and therefore provide no additional information about the likelihood of default or loss.

For the purposes of this study, however, we were unable to determine for all securities which tranches were indeed pari passu. By collapsing like-rated tranches within every deal, we have eliminated all pari passu tranches; however, we may have eliminated some non-pari passu tranches as well. Examples of such non-pari passu tranches include (a) tranches supported by different groups of loans, but rated the same in the same deal; (b) tranches whose corporate guarantor's rating coincided with another rating in the deal. We closely examined our data to include these kinds of coincidentally like-rated securities.

Additionally, we have collapsed tranches that had different maturity but carried the same rating. These tranches are generally pari passu so long as they are outstanding at a given point of time. The decision to collapse tranches that are likely to be pari passu is consistent with our corporate default studies which focus on the issuer rather than the issues as the unit of default analysis. In Appendix IV, we show default rates and material impairment rates based on the larger sample that does not collapse like-rated securities.

9. These are securities that are either denominated in U.S. dollar and/or issued in the U.S. In addition, securities issued in Bermuda, the Cayman Islands and the Channel Islands, but denominated in US dollars are categorized as U.S. structured securities.

10. HEL includes subprime mortgage loans, second-lien mortgage, HELOCs (home-equity-lines-of-credit), and HILs (home-improvement-loans).

**Figure 2 - Percentages of Outstanding Securities at the Beginning of Each Year by Rating\***

|                       | 1994  | 1995  | 1996  | 1997  | 1998  | 1999  | 2000  | 2001  | 2002  |
|-----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Total Outstanding     | 752   | 1620  | 2573  | 3283  | 4232  | 5243  | 6190  | 7136  | 8875  |
| Aaa                   | 41.1% | 36.4% | 33.2% | 34.0% | 34.0% | 34.0% | 33.6% | 32.9% | 31.9% |
| Aa                    | 27.5% | 24.3% | 22.0% | 18.8% | 18.0% | 15.9% | 15.5% | 15.3% | 15.2% |
| A                     | 12.8% | 15.2% | 18.0% | 20.2% | 20.6% | 21.0% | 21.5% | 21.9% | 21.7% |
| Baa                   | 11.8% | 15.6% | 16.6% | 16.2% | 17.3% | 16.7% | 17.5% | 17.0% | 18.3% |
| Ba                    | 3.7%  | 5.1%  | 6.8%  | 7.2%  | 6.6%  | 7.7%  | 6.3%  | 7.1%  | 7.2%  |
| B                     | 2.9%  | 3.3%  | 3.4%  | 3.1%  | 3.3%  | 3.8%  | 4.0%  | 4.2%  | 4.3%  |
| Caa                   | 0.1%  | 0.1%  | 0.0%  | 0.2%  | 0.1%  | 0.3%  | 0.8%  | 0.7%  | 0.7%  |
| Ca/C                  | 0.0%  | 0.1%  | 0.0%  | 0.2%  | 0.1%  | 0.6%  | 0.8%  | 0.8%  | 0.8%  |
| Investment Grade (%)  | 93.2% | 91.5% | 89.7% | 89.2% | 89.8% | 87.6% | 88.1% | 87.1% | 87.1% |
| Speculative Grade (%) | 6.8%  | 8.5%  | 10.3% | 10.8% | 10.2% | 12.4% | 11.9% | 12.9% | 12.9% |

\* Distributions of all Moody's rated structured securities outstanding at the beginning of each year without collapsing same-rated tranches are shown in the appendix.

**Figure 3 - Percentages Of Outstanding Securities At The Beginning Of Each Year By Sector**

|       | 1994  | 1995  | 1996  | 1997  | 1998  | 1999  | 2000  | 2001  | 2002  |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| TOTAL | 752   | 1620  | 2573  | 3283  | 4232  | 5243  | 6190  | 7136  | 8875  |
| ABS   | 21.4% | 26.5% | 31.3% | 37.2% | 41.9% | 46.2% | 48.2% | 50.3% | 48.5% |
| CMBS  | 7.8%  | 6.9%  | 5.4%  | 5.8%  | 8.4%  | 12.1% | 16.1% | 18.4% | 20.8% |
| RMBS  | 70.7% | 66.5% | 63.3% | 57.1% | 49.6% | 41.7% | 35.7% | 31.3% | 30.7% |

As shown in Figure 2, investment-grade securities in U.S. structured finance have outnumbered speculative-grade securities by a large margin. The ratio of investment-grade securities to speculative-grade securities has been above 7-to-1 in recent years.

In the meantime, Aa has become a relatively small rating category within the investment-grade security universe in our sample, even though during the late 1980s and early 1990s it was the most common rating category. Its share in the investment-grade rating universe was surpassed by A in 1996 and by Baa in 1998.

Figure 3 demonstrates there has been strong rating growth in all three structured finance sectors. The CMBS sector has recorded high rating growth rates in recent years, with a growth rate of about 60% in 1999, about 30% in 2000, and about 40% in 2001. The growth of the rated ABS sector has been consistently above 20% since 1999, led primarily by the growth of HEL securities, whose rating growth rates have been about 36% in 1999, 38% in 2000, and 42% in 2001. The RMBS sector also recorded a strong rating growth rate of 22% in 2001.

## Distribution Of Defaults By Sector, Initial Default Event, And Cure Status

### *Distribution Of Payment Defaults By Sector*

Based on our definition of payment default, we have identified 390 securities from 218 deals that have sustained payment defaults through the end of 2002 on securities that were first rated on or after January 1, 1993. Figure 4 presents the number and percentage of defaults across broad sectors. Defaults sometimes affect multiple securities issued by the same SPE.

The 167 ABS defaults arise from 99 deals; the 80 CMBS defaults arise from 29 deals; and the 143 RMBS defaults arise from 90 deals. In the appendix we provide a list of all payment defaults and number of defaults organized by year and sector.

**Figure 4 - Number And Percentage Of Payment Defaults By Sector: 1993-2002**

|  | ABS   | CMBS  | RMBS  | TOTAL |
|--|-------|-------|-------|-------|
| Number of Payment Defaults                     | 167   | 80    | 143   | 390   |
| Total Number of Rated Securities in the Sample | 6522  | 2614  | 4283  | 13419 |
| Percentage of Payment Defaults in Each Sector  | 2.56% | 3.06% | 3.34% | 2.91% |

### *Distribution Of Payment Default By Initial Default Event*

Among 390 payment defaults, 216 securities (about 55%) initially defaulted solely because of interest shortfalls, 166 (about 43%) initially defaulted solely because of loss of principal, and eight securities (about 2%) defaulted initially because of both interest shortfalls and principal losses.

Figure 5 shows the distribution of defaults by these initial default events within each sector. In the CMBS sector, interest shortfalls have accounted for all the initial payment default events to date whereas in the RMBS sector initial defaults have mainly been attributable to a loss of principal.



Under the typical interest-principal-interest-principal (IPIP) and sequential-pay structure, interest is paid to subordinated tranches only after both interest and principal due to senior tranches are paid, and typically junior tranches do not receive principal until all principal payments are made to senior investors.

In many of the defaulted deals in CMBS and some ABS, workouts on the underlying defaulted loans can take a long time, up to three years. If the servicer did not advance on the problem loan and the loan was not written down, interest shortfalls would occur due to the payment priority schedule. The delinquent loan did not generate cash hence the subordinate bonds were short of cash for interest payments before realizing any loss of principal. If the delinquent loans subsequently were liquidated and losses materialized, interest shortfalls and principal losses became permanent. Otherwise, if they were later cured or were expected later to be cured, interest shortfall would be repaid and defaults cured. This partially explains why there were more interest defaulters than principal defaulters in CMBS and ABS.

**Figure 5 - Number Of Payment Defaults By Initial Default Event**

|       | Interest Shortfall | Principal Loss | Interest Shortfall & Principal Loss | Total |
|-------|--------------------|----------------|-------------------------------------|-------|
| ABS   | 109                | 52             | 6                                   | 167   |
| CMBS  | 80                 | 0              | 0                                   | 80    |
| RMBS  | 27                 | 114            | 2                                   | 143   |
| Total | 216                | 166            | 8                                   | 390   |

### ***Distribution Of Payment Default By Cure Status***

Among the 390 payment defaults, 94 (about 24%) were fully cured with no remaining interest shortfalls or principal losses outstanding as of July 2003.<sup>11</sup> Correspondingly, 296 payment defaults still have losses outstanding and remain uncured. In determining the cure status of a payment default and the number of payment periods (the defaulters in our sample all make payments on a monthly frequency) for a default to be cured, we only look at the beginning of a payment default event and the cumulative losses as of July 2003, or as of the final date when the security had cash flow information.

If there were losses outstanding, the payment default is considered uncured even though the first payment default may have been cured and the final loss was the result of new payment default events. Similarly, the number of months from default to the time the security is cured is measured from the initial payment default date to the first date when losses were no longer observed.<sup>12</sup>

The vast majority of cured defaults (88 of the 94 cured defaults) are payment defaults triggered by interest shortfalls. Short term interest shortfalls can be the result of either a technical breakdown of deal structure or the recovery of servicer advances based on their assessment of problem loans.

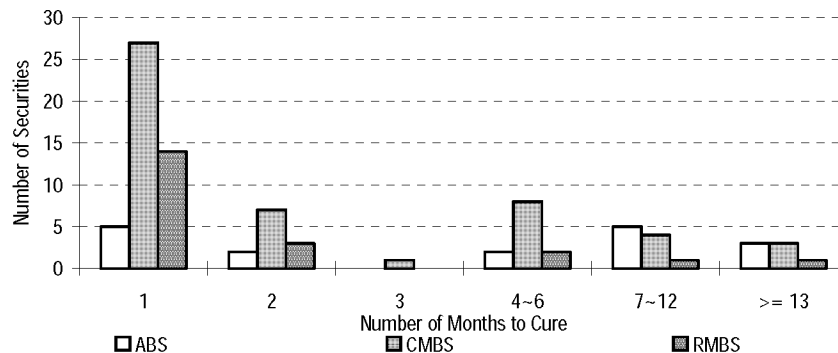
Of the 88 cured interest defaulters, 46 (more than 50%) were cured after just one month, and 59 (or 67%) were cured within three months after the initial payment default. Only 7 (or 8%) were cured after more than one year in payment default. A distribution of months to cure from initial payment default for cured defaults is shown in Figure 6.

By asset class, defaults in CMBS were most likely to be cured, with 63% of all CMBS defaults being cured while ABS had the lowest cure rate at 10%, and RMBS had a 15% cure rate. All cure status is updated as of July 2003.

11. The last default identified in our list began at the end of 2002. As shown in Figure 5, cures after 8 or more months of default are rare. Therefore, we have updated cured status through July 2003.

12. If a security went into default, became cured, but later went back into default, we ignore the "temporary cure" and treat the security as defaulted, using the initial default to determine the default date.

**Figure 6 - Number Of Months From Initial Payment Default To Cure For All 88 Cured Interest-Shortfall Defaulters**



Payment defaults that had principal losses were almost never cured. In fact, it did not matter whether the initial payment default event was a loss of principal or an interest shortfall as long as a security had suffered loss of principal the default was almost never cured.

Specifically, of the 187 defaults that have suffered loss of principal, 174 of these went into payment default initially as principal defaults, and 13 had principal losses after they first missed interest payments, and 181 of the 187 remained uncured as of July 2003.

A security with cured payment defaults could, of course, experience losses again as long as the security has not been paid down. Therefore, the final cure status of a payment default can only be evaluated when payments cease – when it is paid down or written down. In our sample, there were 84 such securities: 20 were ABS, 60 were RMBS, and four were CMBS. Of these 84 securities, 11 defaulted due to interest shortfalls and 73 defaulted due to principal losses. Of the 11 interest defaults, six were cured and five were never cured. The 73 principal defaults were not cured before the end of the sample period.

***Distribution Of Ca/C Rated Securities***

Payment defaults generally result from deterioration in collateral performance; however, the worsening of overall collateral performance that led to the shortfalls of the security’s cash payments do not always lead to downgrades and Ca or C rating assignments. By the same token, a Ca or C rating does not imply that a security is already in default. In our entire sample, 168 securities were at some point or another downgraded to Ca and/or C. Figure 7 shows the number and percentage of Ca or C rated securities by sector.

**Figure 7 - Number And Percentage Of Securities Rated Ca Or C By Sector, 1993-2002**

|  | ABS   | CMBS  | RMBS  | TOTAL |
|--|-------|-------|-------|-------|
| Number of Ca or C Rated Securities             | 99    | 5     | 64    | 168   |
| Total Number of Rated Securities in the Sample | 6522  | 2614  | 4283  | 13419 |
| Percentage of Ca or C rating in Each Sector    | 1.52% | 0.19% | 1.49% | 1.25% |

According to the data in Figure 7, there are only five (or 0.2%) Ca or C rated securities in the CMBS sector. This is in sharp contrast to the large number (80, or 3%) of payment defaults seen in Figure 4. The percentages of ABS and RMBS securities rated Ca or C are also lower than the percentages of defaulted securities (only about half of those in Figure 4). Because payment defaults can be cured, or even if they are uncured, their losses can be small, ratings on these securities – which are based on expected loss – do not necessarily fall to Ca or C simply because a payment default has occurred. Moody’s assigns a Ca or C rating to indicate that losses are expected to be substantial over the lifetime of the security.

***Relationship Between Payment Default And Ca/C Rating and Material Impairment***

Not all securities experiencing payment defaults are rated Ca or C, and not all Ca or C rated securities are experiencing payment defaults, but there is a strong correlation between the two events. Of the 168 Ca or C rated securities, our historical payment records are complete for only 154. Of the 154 Ca or C rated securities for which we have complete data, two securities were paid down without losses,<sup>13</sup> 16 are anticipated to suffer losses in the future, and the remaining 136 securities all had losses at some point during the sample period. Figure 8 breaks down defaults by sector and cure status for payment defaults, Ca or C rated securities, and materially impaired securities.

13. Class A from Autobond Receivables Trust 1995-A and 1996-B were downgraded to Ca in February 2000. The first security was paid down in full in 2001 and the second was paid down in full in 2002.

**Figure 8 - Distribution Of Payment Defaults And Ca Or C Rated Securities By Cure Status And Sector, 1993-2002**

|  | ABS  | CMBS | RMBS | TOTAL |
|--|------|------|------|-------|
| Total Number of Rated Securities in the Sample                           | 6522 | 2614 | 4283 | 13419 |
| All Securities Experiencing Payment Defaults                             | 167  | 80   | 143  | 390   |
| Cured  | 22   | 50   | 22   | 94    |
| Uncured  | 145  | 30   | 121  | 296   |
| All Ca or C rated Securities   | 99   | 5    | 64   | 168   |
| Cured Payment Defaults   | 2    | 0    | 0    | 2     |
| Uncured Payment Defaults   | 66   | 4    | 64   | 134   |
| No Payment Default As of December 2002 but Default Anticipated in Future | 16   | 0    | 0    | 16    |
| No Payment Default and fully paid down by December 2002                  | 2    | 0    | 0    | 2     |
| Incomplete Payment Records   | 13   | 1    | 0    | 14    |
| Material Impairments   | 174  | 31   | 121  | 326   |
| Uncured Payment Defaults   | 145  | 30   | 121  | 296   |
| Not in Payment Default but Ca or C Rated                                 | 29   | 1    | 0    | 30    |

## One-Year Payment Default Rates And Material Impairment Rates

We compute one-year payment default rates of structured securities by cohort rating using the same method adopted in our corporate default study.<sup>14</sup> That is, at the beginning of each year and for each rating category, we construct a cohort that consists of all outstanding securities with a given rating. The one-year payment default rate of a rating category is the total number of securities defaulted in a cohort year divided by the total number of outstanding securities minus one-half of all securities withdrawn during the year.<sup>15</sup>

The material impairment rate is computed in a similar fashion. In addition, the time of material impairment is the time of the first Ca or C rating action or the time of first payment default event, whichever happened first. The number of payment defaults and material impairments in each year during the sample period and by sector appear in the appendix.

Historically, investment-grade one-year default rates have consistently been low. The highest investment-grade payment default rate was seen in 1999, but that was only at 0.67% of the outstanding securities. The speculative-grade one-year default rate had two peaks – one in 1997 (at 9.9%) and the other in 2002 (at 9.1%). Since the year 2000, the speculative-grade default rate has been on a remarkable upswing. Figure 9 illustrates these differences in default rates and the dynamic trends from 1994 to 2002 (there is no 1993 rating cohort because cohorts are formed at the beginning of each year).

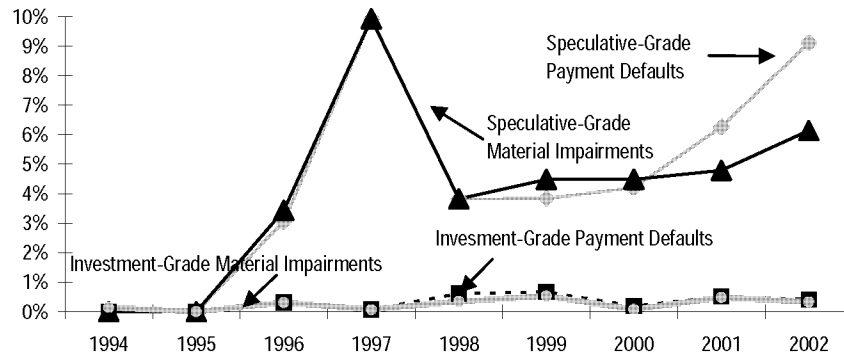
While the difference between investment-grade and speculative-grade has been significant, there was virtually no difference between payment default rates and material impairment rates of speculative-grade securities before 2001 (The 1999 material impairment rate was slightly higher due to a somewhat higher number of Ca or C rating actions.)

Since the year 2001, the payment default rate has started to rise above the material impairment rate for speculative-grade ratings. This is mainly the result of a large number of CMBS interest shortfalls that were cured subsequently. Meanwhile because the sample only includes deals originated since 1993, and defaults generally do not occur in newly originated transactions, the low default rates observed in the earlier years can be the result of our sample construction method.

14. Please refer to "Default & Recovery Rates of Corporate Bond Issuers", Moody's Special Comment, February 2002.

15. This is an adjustment for withdrawn ratings (WR) in a given calendar year. Such adjustments have been made for all default rates in this study. In addition, we assume each security can only default once and that is the first time it sustained a payment default. Once a security went into default, the security would exit from the rating universe and no longer be counted in future rating cohorts. As soon as a security sustained a payment default, we start tracking and computing its loss severity rate.

**Figure 9 – One-Year Payment Default And Material Impairment Rates For Investment-Grade And Speculative Grade Securities**



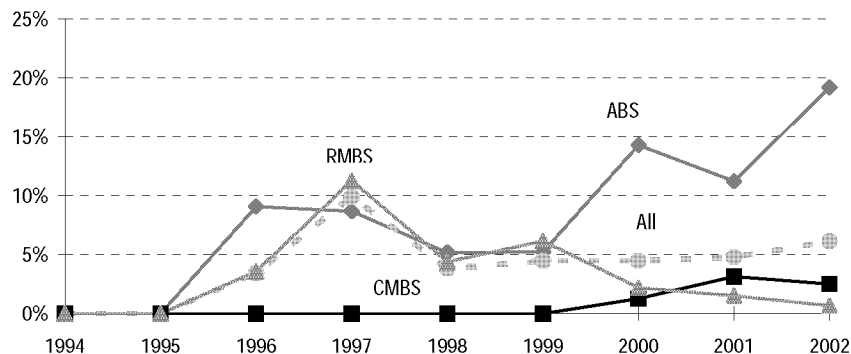
The noticeable spike in 1997 was the result of large number of RMBS tranches defaulting. A high percentage of these 1997 defaults came from securities backed by collateral originated from a single lender, Quality Mortgage. In addition, since 2000 a weakening economy has caused poor performance in parts of the manufactured housing loan sector and franchise loan sector. Some deals backed by subprime mortgage loans also showed signs of distress although the overall collateral performance in the HEL sector is still good.

Furthermore, the recent softening of the commercial real estate market and fall-out from the terrorist attack on September 11 impacted a number of CMBS deals resulting in a surge of interest shortfalls. Figure 10 depicts these trends and differences by sector by deconstructing the all speculative-grade material impairment rate by sector.

According to data in Figure 10, the material impairments in the RMBS sector occurred earlier in the sample period, while ABS and CMBS material impairments were generally more recent. In particular, RMBS had a peak speculative-grade MI rate of 11.3% in 1997, but recorded a 6.2% speculative-grade MI rate in 1999, and the rate dropped to only 1.5% in 2001, and 0.7% in 2002.

In contrast, the ABS sector's speculative-grade MI rate had a big jump in 2000 from 5.3% in 1999, to 14.3%, and further up to 19% in 2002. CMBS had no material impairment before 2000 and stayed low since then.

**Figure 10 - One-Year Speculative-Grade Material Impairment Rates By Sector**



## One-Year Default Rates By Type Of Default And Cohort Rating

In this section, we compare various payment default rates, Ca or C rating transition rates, and material impairment rates by cohort rating.

### One-Year Payment Default And Material Impairment Rates

Figure 11 provides weighted average<sup>16</sup> one-year payment default rates and material impairment rates by cohort ratings, where the weights are the number of securities outstanding in each cohort year as percentages of all outstanding securities from all cohort years. This method puts more weight on default rate experiences in the years when there were more outstanding securities, which corresponds to the most recent years in the sample.

**Figure 11 - One-Year Payment Default And Material Impairment Rates By Rating, 1994-2002**

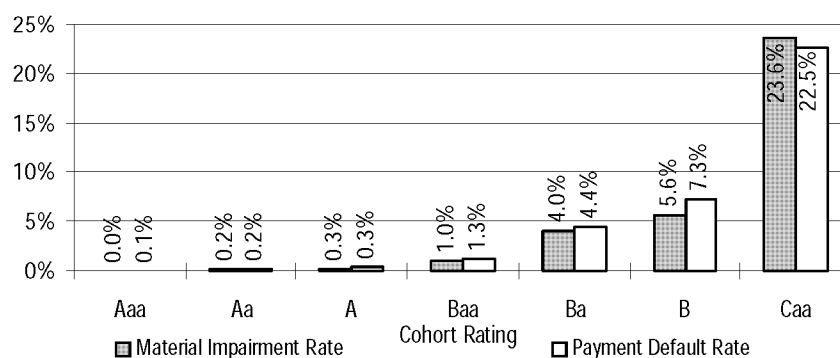


Figure 11 demonstrates a strong inverse correlation between cohort ratings and average one-year payment default rates and material impairment rates, i.e. the lower the ratings, the higher the one-year payment default rates and material impairment rates.

### Default Rates For Different Types Of Default

Strong correlations with Moody's ratings exist not only for one-year payment default rates and for material impairment rates, but they are also present in transition rates to Ca/C ratings and sub-categories of payment defaults, such as cured and uncured payment defaults. We summarize these findings in Figure 12.

Figure 12 presents default rates for seven categories of defaults and impairments. For each cohort rating bucket, the first column provides one-year default rates for payment defaults cured within three months.

The second column is for those cured after three months, and the third column is for uncured payment defaults. The fourth column lists default rates based on anticipated defaults (i.e. Ca or C rated but not yet in payment default).

The fifth column is the sum of columns three and four and shows the material impairment rate. The sixth column includes all payment defaults, both cured and uncured. The last column provides rating transition rates into the Ca/C rating category based on all securities rated Ca or C, regardless of whether they are in payment default or not.<sup>17</sup>

**Figure 12 - One-Year Default Rates By Cohort Rating And Type Of Default, 1994-2002**

|     | Payment Default Cured In 3 Months | Payment Default Cured After 3 Months | Uncured Payment Default | Ca Or C Rated But Not In Payment Default | Material Impairment | All Payment Default | Ca/C Transition Rates |
|-----|-----------------------------------|--------------------------------------|-------------------------|--|---------------------|---------------------|-----------------------|
|     | (1)                               | (2)                                  | (3)                     | (4)                                      | (3)+(4)=(5)         | (1)+(2)+(3)=(6)     | (7)                   |
| Aaa | 0.05%                             | 0.00%                                | 0.01%                   | 0.00%                                    | 0.01%               | 0.06%               | 0.00%                 |
| Aa  | 0.05%                             | 0.06%                                | 0.12%                   | 0.12%                                    | 0.24%               | 0.23%               | 0.12%                 |
| A   | 0.02%                             | 0.05%                                | 0.25%                   | 0.02%                                    | 0.27%               | 0.32%               | 0.07%                 |
| Baa | 0.22%                             | 0.16%                                | 0.90%                   | 0.09%                                    | 0.99%               | 1.28%               | 0.30%                 |
| Ba  | 0.41%                             | 0.08%                                | 3.88%                   | 0.08%                                    | 3.95%               | 4.36%               | 2.06%                 |
| B   | 1.19%                             | 1.13%                                | 5.02%                   | 0.56%                                    | 5.58%               | 7.34%               | 3.04%                 |
| Caa | 0.54%                             | 4.53%                                | 17.47%                  | 6.11%                                    | 23.58%              | 22.54%              | 13.30%                |

16. All default rates in this study are weighted average default rates unless noted otherwise.

17. For all other rating transition rates in structured finance, please refer to "Structured Finance Rating Transitions: 1983-2002, Comparisons with Corporate Ratings and Across Sectors", Moody's Special Comment, January 2003.

Figure 12 demonstrates that, regardless of the default classifications, the one-year default rate has generally aligned well with cohort ratings, with the lower the rating, the higher the one-year default rate. There are several notable additional observations related to Figure 12.

First, a comparison between columns (6) and (5) shows the Aaa payment default rate is much higher than the Aaa material impairment rate implying that Aaa payment defaults are almost all cured defaults. Furthermore, comparing columns (1) and (2) shows that cured Aaa payment defaults were all cured within three months. Correspondingly, Aaa material impairment rates have been extremely low.

Second, within the investment-grade universe, Baa payment default rates and material impairment rates are markedly higher than those of Aaa, Aa, and A. Aa and A's default rates and impairment rates are very similar. Additionally, investment-grade (except for Aa) securities have had higher payment default rates than material impairment rates.

Third, within the speculative-grade rating universe sharp differences in payment default, material impairment, and Ca/C transition rates are evident across the Ba, B and Caa rating categories. This means that the default classification used has a particularly significant impact on speculative-grade default rates.

Fourth, even for cured defaults in column (1) and (2) there exists some inverse correlation between default rate and cohort ratings.

Finally, for all rated securities, both one-year material impairment rates and payment default rates have on average been much higher than one-year Ca/C transition rates. In fact, the Ca/C transition rate is only about half of the material impairment rates for most of the rating categories.

## Multi-Year Material Impairments Rates By Cohort And Original Rating

In this section, multi-year cumulative material impairment rates are presented. Recall that material impaired securities consist of uncured payment defaults and Ca or C rated securities that are not yet in payment default. Our sample includes a total of 326 material impairments: 174 ABS, 31 CMBS, and 121 RMBS. Distribution of these materially impaired securities by time and sector is shown in the appendix. From this section on we will focus on material impairment rates exclusively. Data details on multi-year material impairment rates by rating categories appear in the appendix.

### Multi-Year Material Impairment Rate By Cohort Rating

The cumulative material impairment (MI) rates by cohort rating presented below are computed using the same method as in Moody's annual corporate default study.<sup>18</sup> That is, we first compute marginal material impairment rates each year given a rating cohort. The marginal MI rate is the number of securities that become materially impaired during a given year following the formation of a cohort as a percentage of the total securities that were unimpaired and still outstanding at the beginning of the year. Each year's marginal MI rate is a MI rate adjusted for ratings withdrawn by reducing the number of securities in the beginning of the year by half the number of securities whose ratings were withdrawn, implicitly assuming that withdrawals were evenly spaced throughout the year. Marginal MI rates are then averaged (weighted by the number of securities in the cohort year) across cohorts.

Cumulative MI rates are calculated iteratively. The first year's cumulative MI rate is the same as its marginal MI rate. Thereafter, the cumulative MI rate for horizon T is equal to the cumulative MI rate of horizon T-1 plus the marginal MI rate for T, times the survivors (one minus the cumulative MI rate at time T-1).

Figure 13 presents cumulative MI rates over a five-year horizon and for each cohort rating category. While cumulative MI rates for Aa and A ratings are fairly similar, the difference between Aaa and Aa/A is quite large, and between Aa/A and Baa it is also large. That is, within the investment-grade sector, rating categories provide fairly sharp differentiation for material impairments over multiple time horizons.

Similarly, Figure 13 also indicates that while cumulative MI rates for Ba and B ratings are fairly similar, the difference between Caa and Ba/B is quite large. Moreover, the difference between the cumulative MI rates for Baa and Ba/B are also large. Therefore, within the speculative-grade sector, the rating categories also provide fairly sharp differentiation with material impairments over multiple time horizons.

| Cohort Rating | Years After Cohort Formed |        |        |        |        |
|---------------|---------------------------|--------|--------|--------|--------|
|               | 1                         | 2      | 3      | 4      | 5      |
| Aaa           | 0.01%                     | 0.08%  | 0.23%  | 0.42%  | 0.56%  |
| Aa            | 0.24%                     | 0.47%  | 0.80%  | 1.13%  | 1.23%  |
| A             | 0.27%                     | 0.79%  | 1.20%  | 1.42%  | 1.48%  |
| Baa           | 0.99%                     | 2.53%  | 5.01%  | 6.49%  | 8.36%  |
| Ba            | 3.95%                     | 9.05%  | 12.37% | 16.48% | 17.95% |
| B             | 5.58%                     | 11.78% | 16.87% | 19.18% | 20.35% |
| Caa           | 23.58%                    | 26.33% | 28.79% | 28.79% | 28.79% |

18. "Default & Recovery Rates of Corporate Bond Issuers: A Statistical Review of Moody's Ratings Performance 1970-2001", Moody's Special Comment, 2002.

### ***Multi-Year Material Impairment Rate By Original Rating***

The original ratings on structured securities are Moody's assessment of these securities' credit risk at the time the transaction is originated and first sold into the market. These ratings attempt to differentiate securities by their relative expected loss rates as of the origination date. In this section, we look at material impairment rates by original ratings, while still recognizing that loss rates, and not material impairment rates alone, are the primary determinants of structured finance ratings.

To study material impairment rates by original ratings, we form cohorts by original rating and origination year (also called vintages). We then use the same method for a cohort rating based default rate to calculate cumulative material impairment rates for each rating vintage. That is we first calculate marginal material impairment rates in each year for a given rating vintage, then calculate marginal unimpaired rates and cumulative unimpaired rates, and finally, cumulative material impairment rates. As is done for material impairment rates by one-year cohorts, material impairment rates by original rating are also adjusted to reflect withdrawn ratings.

Figure 14 displays these cumulative material impairment rates by original rating and years since origination. The cumulative MI rates by original rating in Figure 14 are markedly lower (on average less than half) than those by cohort rating in Figure 13 with the exception of the Aa rating category. There is also a strong correlation between original rating and material impairment rate and such correlation becomes stronger over longer time horizons. Notice that the size of Caa rating category is particularly small.<sup>19</sup>

| Original Rating | Years After Origination |       |       |        |        |
|-----------------|-------------------------|-------|-------|--------|--------|
|                 | 1                       | 2     | 3     | 4      | 5      |
| Aaa             | 0.00%                   | 0.00% | 0.03% | 0.16%  | 0.24%  |
| Aa              | 0.54%                   | 0.81% | 1.14% | 1.51%  | 1.60%  |
| A               | 0.03%                   | 0.34% | 0.65% | 0.83%  | 0.86%  |
| Baa             | 0.26%                   | 1.09% | 2.27% | 3.33%  | 3.87%  |
| Ba              | 0.43%                   | 2.51% | 5.16% | 6.60%  | 7.16%  |
| B               | 0.90%                   | 4.16% | 9.10% | 10.57% | 11.30% |
| Caa             | 4.00%                   | 4.00% | 8.27% | 8.27%  | 8.27%  |

The performances of the following three sets of securitizations account for the non-intuitive rank ordering of Aa and single A original rating default rates. Two sets of these deals, BankAmerica and UCFC Funding, were in the manufactured housing sector and did not have A-rated tranches. When those deals sustained large interest shortfalls, losses went up the waterfall to the Aa tranche. In addition, all NPF (National Premier Financial) healthcare receivables securitizations sponsored by National Century Financial Enterprises, Inc. (NCFE) were structured into just two tranches – one Aaa and one Aa – and subsequently all Aa tranches were downgraded to Ca or C.

### ***The Seasoning Pattern In Marginal Material Impairment Rate***

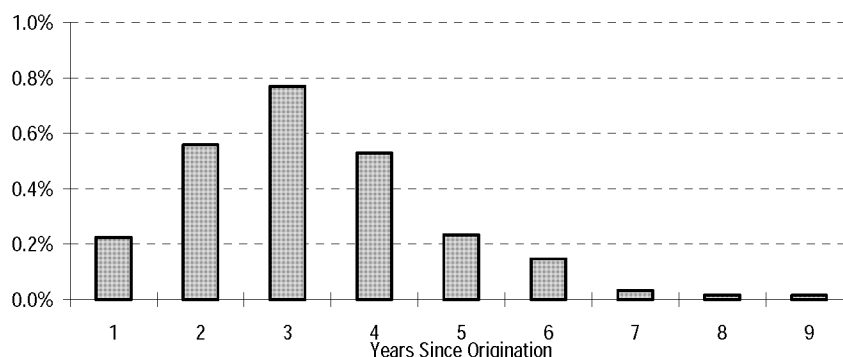
A notable phenomenon from both Figures 13 and 14 is that MI rates of all rating categories appear to increase faster in earlier years than in later years. To further examine this pattern, we group all ratings together and follow their aggregate marginal material impairment rates as they season (i.e. as ratings age, measured in years since origination). Figure 15 shows there are substantial increases in material impairments in the first three years since origination and then a significant drop in the fifth year followed by continued declines.

In fact, this seasoning pattern of marginal material impairment rates also can be observed within most of the individual rating categories even though the timing of the peak is not the same across ratings. This suggests that there is a seasoning pattern in the marginal material impairment rate that is not related to specific ratings, but more pertinent to the collateral's performance.<sup>20</sup>

19. There were five defaulters originally rated Caa, all within the CMBS sector. Four of them have remained Caa rated and one was downgraded to C.

20. We note that the majority of payment defaults, and to a lesser extent, material impairments, are in residential mortgage-backed securities and HEL securities whose seasoning pattern is most evident.

**Figure 15 - Marginal Material Impairments Rates By Years Since Origination, 1993-2002**

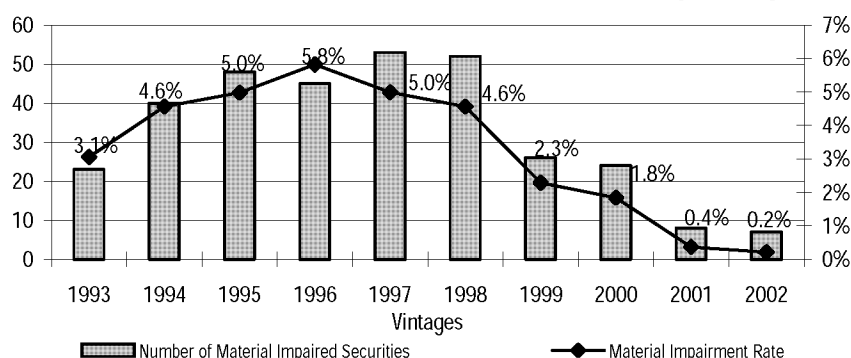


The seasoning pattern helps to explain why default rates by original rating tend to be lower than those by cohort rating on the same time horizon. A vintage rating cohort consists of all new ratings assigned in that vintage year while a standard rating cohort mixes ratings of different ages. Figure 15 shows that defaults appear to exhibit a seasoning pattern regardless of ratings, i.e. the likelihood of default for moderately seasoned securities is higher than that for newly issued securities or for well-seasoned securities. Therefore, for any given time and given horizon in our sample (which consists of a mixture of new and moderately seasoned securities), default rates of a mixed cohort will be generally higher than those of a cohort of new issues.

**Material Impairment Rate by Vintage**

Finally, we show material impairment counts and material impairment rates by vintage. According to Figure 16, the 1997 and 1998 vintages had the most material impairments while the 1996 vintage had the highest material impairment rate. However, overall material impairment rates were quite similar between 1994 and 1998, and more recent vintages since 1999 had lower MI rates, but will likely experience more material impairments as they season.

**Figure 16 - Cumulative Material Impairment Rates To Date By Vintage, 1993-2002**



**Material Impairment Rates by Sector**

So far, our cumulative material impairment rate analysis has been based on material impairments in all three sectors – ABS, CMBS and RMBS – combined. We have found that material impairment rates, on average, have been strongly correlated with Moody’s ratings over both short- and long-term horizons. In this section, we analyze material impairment rates by individual sector. In Figure 17, we first compare average one-year material impairment rates across sectors. Other descriptive statistics including standard deviations, median, and percentile values of one-year MI rates, as well as data on cumulative payment default rates and material impairment rates by cohort rating and original rating are provided in the appendix.



**Figure 17 - One-Year Material Impairment Rates By Cohort Rating And Sector, 1994-2002**

| Cohort Rating | Aaa   | Aa    | A     | Baa   | Ba    | B      | Caa    |
|---------------|-------|-------|-------|-------|-------|--------|--------|
| ABS           | 0.00% | 0.67% | 0.30% | 1.14% | 9.44% | 15.97% | 70.83% |
| CMBS          | 0.00% | 0.00% | 0.10% | 0.42% | 0.94% | 2.86%  | 1.85%  |
| RMBS          | 0.02% | 0.03% | 0.28% | 1.14% | 2.64% | 5.56%  | 24.66% |
| TOTAL         | 0.01% | 0.24% | 0.27% | 0.99% | 3.95% | 5.58%  | 23.58% |

*Note: Sample size for the ABS Caa rating category is very small.*

According to the data in Figure 17, weighted average one-year material impairment rates are correlated with cohort ratings for each sector with the higher the rating the lower the material impairment rate. The Aa rating category is the only exception due to the small sample size, as discussed in the previous section.

The number of outstanding speculative-grade securities, particularly the number of B and Caa-rated securities, is typically small in each sector. Hence their material impairment rates can be unstable and are subject to small sample biases. For instance, the B rating category in the ABS sector had 42 rating observations outstanding in 2001 (for the B category, 2001 is the largest of all cohorts). There were 10 material impairments in 2001 in this rating category, resulting in a 25% material impairment rate for this year.

Similarly, there were 10 ABS Caa-rated securities in 2002 and five of them became materially impaired. This results in a 50% impairment rate for the Caa rating category in 2002. A small change in the number of materially impaired securities can dramatically change the material impairment rate for these small rating categories.

Also notable in Figure 17 is the difference in material impairment rates across sectors. CMBS had the lowest material impairment rate while ABS had the highest. In fact, material impairment rates for CMBS are substantially lower across all rating categories except Aaa. Between ABS and RMBS, the difference is more pronounced for speculative-grade ratings than for investment-grade ratings (Aa is an exception). These differences are partly the result of the failures of a small number of originators or issuers like Green Tree/Conseco and Quality Mortgage (to be discussed in detail below).

The differences are also partly the result of diverse cyclical characteristics of each sector (For example, our sample period has not encompassed more than a full credit cycle in the residential or commercial real estate market.) Therefore, these large differences in realized material impairment rates across these sectors may not persist into the future.

### ***Material Impairment Rates In ABS***

Among materially impaired ABS, most have been backed by manufactured housing loans (80, or 46% of all ABS material impairments), franchise loans (31, or 18% of ABS material impairments) and HEL (31, or 18% of ABS material impairments). These three asset types account for 82% of all ABS material impairments.

However, among the asset subcategories healthcare securitizations had the highest material impairment rate. This is followed by franchise-loan backed securities and manufactured housing loan securitizations. While not yet in payment default, 12 healthcare-receivable securities were rated Ca due to the fraud committed by their sponsor – National Century Financial Enterprises, Inc. (NCFE), and expected to suffer material losses in the near future. This resulted in a 40% material impairment rate for this small asset type. Other receivable securitizations such as trade receivables, timeshare receivables and future receivables had no defaults during the same period.

Because the total number of rated HEL securities is fairly large, 31 HEL material impairments (24 of these backed by subprime mortgage loans) are only a small fraction (1.3%) of all rated HEL securities, suggesting that HEL is still a relatively less impaired asset type (comparable to autos) within the ABS sector.

Figure 18 compares the material impairment rates across asset types in ABS. It shows that while healthcare receivables and franchise loan securitizations suffered significantly during the sample period, many other ABS asset types have performed very well, either sustaining low material impairment rates or no material impairment at all. This is particularly evident for securities backed by student loans, small business loans, floor plans, and credit-card receivables transactions.

**Figure 18 - Number And Percentage Of ABS Material Impairments From 1993 To 2002**

| ABS Collateral Type    | Total Number Of Rated Securities In The Sample | Number Of Material Impairments | Percentages |
|------------------------|--|--------------------------------|-------------|
| Healthcare Receivables | 30   | 12                             | 40.0%       |
| Franchise Loans        | 136  | 31                             | 22.8%       |
| Manufactured Housing   | 661  | 80                             | 12.1%       |
| Autos                  | 623  | 9                              | 1.4%        |
| HEL                    | 2320   | 31                             | 1.3%        |
| Leases                 | 368  | 3                              | 0.8%        |
| Credit Cards           | 1272   | 4                              | 0.3%        |
| Equipment              | 70   | 0                              | 0.0%        |
| Floor-plans            | 105  | 0                              | 0.0%        |
| Small Business Loans   | 108  | 0                              | 0.0%        |
| Student Loans          | 343  | 0                              | 0.0%        |
| Other Receivables      | 68   | 0                              | 0.0%        |
| Other ABS              | 418  | 4                              | 1.0%        |
| ABS Sum                | 6522   | 174                            | 2.7%        |

Loan origination in the manufactured housing and franchise-loan sectors, the two most impaired sectors in ABS, was competitive in the late 1990s. Manufactured housing loans are made to low income consumers and franchise loans are typically made to owners of small businesses like fast food, video rentals, and quick-lube franchises. The two types of securitizations both primarily serve small and low-income borrowers whose economic circumstances are sensitive to cyclical changes and therefore were sharply affected during the recent economic downturn.

Also significant in the ABS sector were the troubles of Conseco Finance (formerly Green Tree Finance). In fact, 30 of the 80 (37.5%) material impairments in manufactured-housing loan securities were associated with Green Tree/Conseco securities either because of poor collateral performance or because of the weakening of a corporate guaranty provided by Green Tree/Conseco. Most (a total of 25) of these securities were originally rated Baa1 or Baa3 due to Green Tree's guaranty.

The default of these securities has impacted the Baa material impairment rate in the ABS sector. The overall effect on default rates from Green Tree/Conseco is found to be small once all Green Tree deals are excluded. This is because there are a large number of Green Tree/Conseco related securities in the sample.

In addition, there were four material impairments from two Heilig-Meyers deals in the ABS sector that were the result of corporate failure. Overall, the failures of Conseco, NCFE, and Heilig-Meyers contributed 46 material impairments, or 26% of the 174 total material impairments in the ABS sector.

Figure 19 shows the weighted average cumulative material impairment rates for the ABS sector. Within the ABS sector, Moody's ratings have rank-ordered material impairment (MI) rates of all horizons. Material impairment rates are generally higher for lower rating categories (Aa is the only exception due to a small sample), especially for speculative-grade securities. For the Caa rating category, MI rates for the four- and five-year horizons cannot be calculated because there was no security outstanding in the fourth year after the cohort was formed.

**Figure 19 - Cumulative Material Impairments Rates In ABS By Cohort Rating, 1994-2002**

| Cohort Rating | Years After Cohort Formed |        |        |        |        |
|---------------|---------------------------|--------|--------|--------|--------|
|               | 1                         | 2      | 3      | 4      | 5      |
| Aaa           | 0.00%                     | 0.02%  | 0.06%  | 0.06%  | 0.06%  |
| Aa            | 0.67%                     | 1.25%  | 2.03%  | 2.83%  | 3.13%  |
| A             | 0.30%                     | 0.85%  | 1.32%  | 1.61%  | 1.61%  |
| Baa           | 1.14%                     | 2.88%  | 6.74%  | 8.85%  | 13.44% |
| Ba            | 9.44%                     | 23.47% | 31.66% | 47.50% | 53.08% |
| B             | 15.97%                    | 36.00% | 44.44% | 49.38% | 49.38% |
| Caa           | 70.83%                    | 70.83% | 70.83% | NA     | NA     |

Note: Sample sizes for the B rating category four years after cohort formation and for the Caa rating category are very small.

### Material Impairment Rates In CMBS

The CMBS sector has witnessed a large number of securities experiencing interest shortfalls since 2001. CMBS payment defaults to date have been entirely caused by interest shortfalls. The reasons for interest shortfalls include appraisal reduction (the result known as ASER—Appraisal Subordinate Entitlement Reduction), loan modifications, unanticipated terrorism insurance expenses, special servicing fees, and unanticipated legal expenses. Among these, appraisal reductions and special servicing fees were the two leading reasons. Interest shortfalls in CMBS have sometimes affected senior CMBS tranches owing to the current servicer advancing and recovery mechanism. This mechanism allows servicers to recover advances in one rather than multiple payment periods.<sup>21</sup> Many of these interest shortfalls were cured within a short period of time.

21. For more detailed discussions on this subject, please refer to "CMBS: Smoothing Recoveries of Servicers Advances to Minimize Interest Shortfalls", Moody's Structured Finance Special Report, July 2003.

Out of a total of 80 payment defaults, 49 were cured and 31 were not cured (and hence materially impaired) by July 2003.<sup>22</sup> There were five securities rated Ca or C before the end of 2002, and four of them came from a single deal, Morgan Stanley Capital I 1998-CF1. Of the 31 materially impaired CMBS securities, 20 were backed by large multi-borrower loan pools, 10 were backed by small multi-borrower loan pools and one by a single asset.

Figure 20 shows cumulative MI rates by cohort rating in the CMBS sector. There are three notable observations in Figure 20.

First, cumulative MI rates of Baa, Ba and B rated CMBS securities are strongly differentiated across all shown horizons, and the MI rates for B-rated securities are much higher than those for Baa and Ba.

Second, cumulative MI rates of Aaa and Aa rated securities are zero, indicating particularly strong performance in these two CMBS rating categories.

Third, the Caa rating category appears to have lower average MI rates than the B category, but the number of observations in this rating category has been small. Any small changes in the cure status of a payment default in this rating category can cause wide swings in its material impairment rates. In fact, the Caa MI rate changed significantly when two Caa-rated securities were cured in 2003 after they first sustained a payment default before the end of 2002.

We note that the CMBS sector typically lags the performance of the corporate sector, as tenants reduce their use of space before loans on property default. The cutoff of our study period at year-end 2002 misses what is likely to be a pickup in loan delinquencies and bond defaults. We will investigate these additional defaults in a future study after the sample period is extended.

**Figure 20 - Cumulative Material Impairments Rates In CMBS By Cohort Rating, 1994-2002**

| Cohort Rating | Years After Cohort Formed |       |        |        |        |
|---------------|---------------------------|-------|--------|--------|--------|
|               | 1                         | 2     | 3      | 4      | 5      |
| Aaa           | 0.00%                     | 0.00% | 0.00%  | 0.00%  | 0.00%  |
| Aa            | 0.00%                     | 0.00% | 0.00%  | 0.00%  | 0.00%  |
| A             | 0.10%                     | 0.26% | 0.53%  | 1.03%  | 1.03%  |
| Baa           | 0.42%                     | 0.99% | 1.55%  | 2.23%  | 2.23%  |
| Ba            | 0.94%                     | 2.20% | 4.33%  | 5.17%  | 5.17%  |
| B             | 2.86%                     | 7.07% | 12.92% | 15.68% | 19.43% |
| Caa           | 1.85%                     | 4.70% | 9.85%  | 9.85%  | 9.85%  |

*Note: Sample size for the Caa rating category three years after cohort formation is very small.*

### Material Impairment Rates In RMBS

There were a total of 121 RMBS material impairments. All of them had payment defaults and had loss of principal. Sixty of them were rated Ca or C before the end of 2002. Of the 121 materially impaired securities, 113 defaulted solely due to principal write-down.

A large number of defaulted RMBS securities were backed by loans originated from a single mortgage lender, Quality Mortgage. Of the 121 securities, 75 (or 62% of them) involving 40 deals, were from this lender. Of these 75 securities that defaulted, 60 defaulted during 1997, 1998, and 1999. These securities were the major contributors to high RMBS material impairment rates in those three years. In fact, Moody's downgraded 101 securities from 43 Quality Mortgage deals in 1998 and further downgraded 94 securities from 38 deals in 1999.

The mortgage loan pools underlying these deals performed poorly, and contained high percentages of investor properties, two to four family properties, and loans originated with inadequate documentation.<sup>23</sup> High losses were the result of poor origination and underwriting practices, including weak appraisals and loans made to risky borrowers. These problems were further exacerbated by high geographic concentration in the affected pools.<sup>24</sup>

Figure 21 illustrates the relationship between RMBS cohort ratings and their cumulative MI rates. As we can see, RMBS cohort ratings have generally had the correct rank ordering and distinguishable cumulative MI rates over each of the five horizons shown. Cumulative MI rates of Baa ratings have been closer to those of Ba ratings in RMBS than in ABS and CMBS. Also, cumulative MI rates of Ba and B rated RMBS securities have been much lower than those of similarly rated ABS and CMBS securities. Also, after two years, Aaa rated RMBS had sustained slightly higher cumulative MI rates than Aa rated RMBS.

22. If interest shortfalls were caused by appraisal reductions or loan modifications, investors will likely receive reduced interest payments for all future payment periods.

23. For more information on these deals, please refer to "Moody's Downgrades 101 Classes of Quality Mortgage MBS", Moody's Press Release, May 1998.

24. For more information on these rating actions, please refer to "Moody's Downgrades 94 Classes from DLJ's Quality Mortgage Deals", Moody's Press Release, July 1999.

**Figure 21 - Cumulative Material Impairments Rates In RMBS By Cohort Rating, 1994-2002**

| Cohort Rating | Years After Cohort Formed |        |        |        |        |
|---------------|---------------------------|--------|--------|--------|--------|
|               | 1                         | 2      | 3      | 4      | 5      |
| Aaa           | 0.02%                     | 0.15%  | 0.42%  | 0.76%  | 0.97%  |
| Aa            | 0.03%                     | 0.13%  | 0.32%  | 0.55%  | 0.61%  |
| A             | 0.28%                     | 0.86%  | 1.21%  | 1.30%  | 1.42%  |
| Baa           | 1.14%                     | 2.90%  | 5.00%  | 6.30%  | 7.25%  |
| Ba            | 2.64%                     | 5.31%  | 7.31%  | 8.61%  | 9.65%  |
| B             | 5.56%                     | 10.29% | 14.52% | 16.42% | 17.17% |
| Caa           | 24.66%                    | 28.52% | 28.52% | 28.52% | 28.52% |

*Note: Sample size for the Caa rating category is very small.*

## Material Impairment Rates On Structured And Corporate Ratings

While both corporate and structured ratings reflect the likelihood of default and financial loss suffered in the event of default, structured ratings rely more heavily on estimates of expected loss rates than do corporate ratings. Default risk plays a much more significant role in corporate rating assignments than in structured rating assignments. The performance of structured ratings should not be measured on frequencies of default alone. Comprehensive comparisons of ratings performance in the two sectors will be presented in a future research report.

Unlike Moody's annual corporate default study, which includes data that extends as far back as 1920, this default study only incorporates data back to 1993, which encompasses only one economic cycle. Further, much of recent issuance occurred during one of the longest economic expansions in US history, which in turn was followed by one of the shortest recessions. Also, interest rates were falling during most of the study period. Therefore, we caution the interpretation of these early results both on an absolute basis and in comparison to default study statistics for the corporate or other sectors.

Figure 22 compares cumulative material impairment rates on structured and corporate ratings over the same sample period 1993-2002, both by cohort rating and original rating, grouped into investment-grade and speculative-grade. Detailed data by specific rating category are shown in Appendix V. Additionally in Figure 22 we define material impairment in the corporate sector similarly by combining defaults and Ca or C rated issuers, whichever occurred first. We also have used only corporate ratings initially assigned during the same period from 1993 to 2002. All MI rates are adjusted for withdrawn ratings.

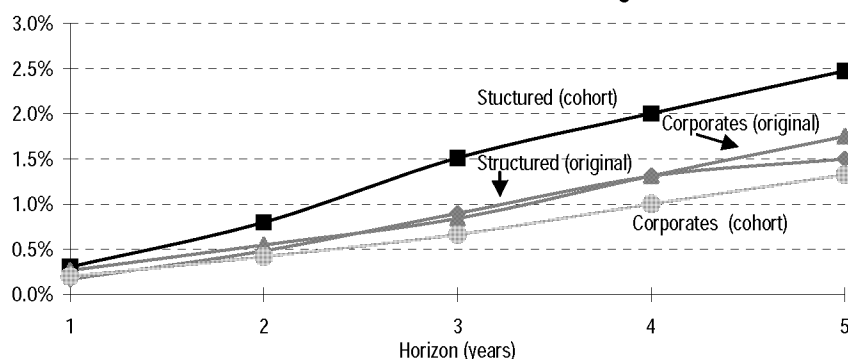
Note that there are significant differences in rating distributions across the two sectors. For instance, the percentage of Aaa ratings among investment-grade securities is much higher in the structured sector than in the corporate sector, while the percentage of Caa ratings among speculative-grade securities is much lower. The first potentially biases downward the investment-grade material impairment rates of structured securities relative to corporate securities, and the second biases downward speculative-grade material impairment rates of structured securities.

With these differences between the two sectors recognized, we examine a few key observations in Figure 22. First, by cohort rating investment-grade MI rates on average are higher in the structured securities than in the corporate issuers, and more so over longer horizons. By original rating, investment-grade MI rates are similar between the structured and corporate sectors. These points are illustrated in panel A of Figure 22.

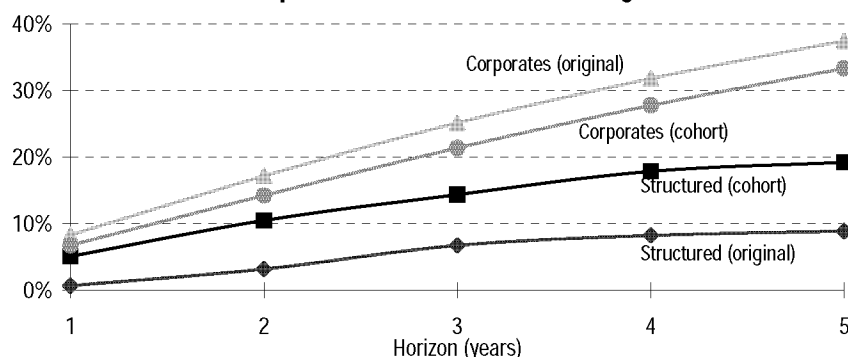
Secondly, as shown in panel B of Figure 22, speculative-grade MI rates are generally much lower in structured than in corporate both by original rating and cohort rating (the cohort-rating-based Ba MI rates is the only exception). Note that the percentage of speculative-grade securities, particularly, the B and Caa rated securities, is much smaller in structured finance than in corporate finance. The comparison of MI rates by rating category presented in Appendix V, however, shows that lower speculative-grade MI rates in structured finance are not driven entirely by differences in the two sectors' rating distributions.

**Figure 22 - Comparing Multi-Year Material Impairment Rates Between Structured And Corporate Sectors By Cohort And Original Rating, 1993-2002**

**Panel A: Investment-Grade Securities Altogether**



**Panel B: Speculative-Grade Securities Altogether**



*Note: Under a cohort-rating method, rating buckets (cohorts) are formed at the beginning of each year. Cumulative MI rates are calculated by tracking their MIs over time. Under an original-rating (or vintage) method, rating buckets are formed at origination and they are kept constant over time. Cumulative MI rates are calculated by tracking their MIs over time.*

Third, unlike structured securities whose original-rating-based MI rates are generally lower than their cohort-rating-based MI rates, investment-grade corporate MI rates are similar between original-rating-based and cohort-based MI rates. However, for speculative-grade corporate issuers, original-rated-based MI rates are higher than cohort-based MI rates. This suggests that seasoning patterns may be different across the structured and corporate sectors.

Finally, we note that structured finance is a much younger sector than corporate finance. What has been realized in the past ten years may not necessarily represent what is going to happen in the future. It usually takes a few credit cycles to obtain a full assessment of default risk on rated securities. As sample periods extend into the future and more default and loss data become available, estimates of material impairment rates in aggregate or by rating category are expected to become more reliable.

## Loss Severity Rates Of Payment Defaults

Moody's structured ratings are Moody's opinions on the expected loss rates of structured securities. While we have concentrated on payment defaults and anticipated defaults, default represents only one part of the loss rate measurement. In this last section, we look at some simple descriptive statistics summarizing cumulative loss severity rates as of origination date. In future research, we plan to examine in-depth other measures of loss severity rates, loss rates and their relationship with ratings.

We define the cumulative loss severity rate as the sum of present values of periodic losses as of the origination date. It is measured as a percentage of original balance. Periodic losses include both interest shortfalls and principal losses. Implied-coupon rates are used as discount rates to compute the present value of losses.

For fixed-rate coupon securities, the implied-coupon rate is the fixed-coupon rate. For variable-rate-coupon securities, implied-coupon rates are computed by dividing the interest payment each period by the outstanding principal balance of the security. In cases of irregular interest payments, their discount rates were smoothed using regular discount rates in neighboring payment periods.

Because losses on defaulted structured securities accumulate gradually over time, complete information about lifetime losses on defaulted securities is available only for those few (84 in total) defaulters in our sample that have ceased making their payments (i.e. paid down or written down defaulters). For the 306 defaulters that have not yet ceased their payments, lifetime cumulative loss rates are not available.<sup>25</sup> For these we only compute their cumulative losses to date as of December 31, 2002.

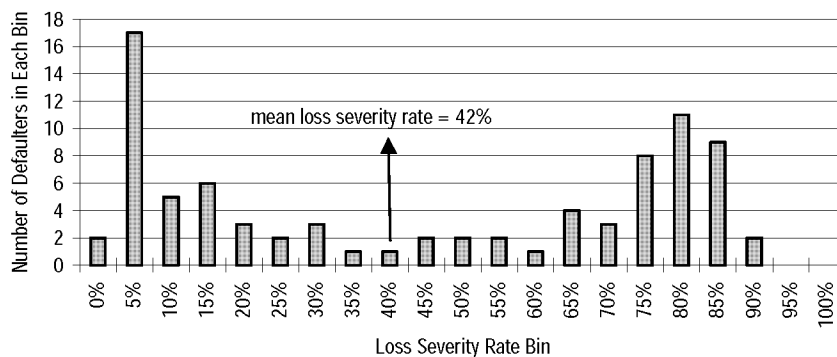
### ***Loss Severity Rates Of Payment Defaults That Had Zero Outstanding Balances***

Among the 84 defaulters that have had zero outstanding balances, 60 were RMBS, 20 were ABS (including 14 home equity loan-backed, three manufactured housing loan-backed, two franchise loan-backed and one auto loan-backed securities), and four were from CMBS. Six (two RMBS and four CMBS) of the 84 were cured before their last payment date and hence suffered zero lifetime cumulative losses.<sup>26</sup> More than half (a total of 44) of the 84 were originated in 1994 and 1995. In other words, this smaller sample of ceased defaulters largely represents materially impaired RMBS and ABS securities and earlier vintages. It does not represent the entire sample of payment defaulters in this study that spans ten years and includes CMBS defaulters.

Figure 23 depicts the distribution of lifetime cumulative loss severity rates based on these 84 defaults. With this limited sample (84 securities represent only 21.5% of all 390 payment defaults), we find that the mean loss severity rate was around 42% (or, a recovery rate of 58%) of the original balance. When original tranche balances are used as weights, the weighted average loss severity rate decreases to 26%, reflecting differences in size of tranches with different ratings (i.e. highly rated tranches tend to be bigger and lowly rated tranches are typically smaller).

Figure 23 also suggests there are large variations in loss severity rates with the standard deviation about 33%. Some defaulters suffered minor losses and their average cumulative loss rates were in the range of 5% to 10%. Other defaulters sustained high losses and their average cumulative loss rates went up to somewhere between 80% and 85%. Those with lower loss severity rates typically defaulted late when much of the original principal balance may have already been repaid or their losses had accumulated more slowly, and those with higher loss severity rates defaulted earlier or losses accumulated faster in the lives of the transactions. The bimodal phenomenon can also be attributed to the dispersion in tranche sizes and differences in what caused the disruption of payments.

**Figure 23 - Distribution Of Lifetime Cumulative Loss Severity Rates Of Defaulters That Had Zero Outstanding Balances (84 In Total), 1993-2002**



### ***Loss Severity Rates To Date Of All Payment Defaults By Sector***

The sample of defaulters that zero outstanding balances is a small portion of all payment defaulters. Statistical inferences based on such a small sample may not be very reliable and comparisons across sectors may not be meaningful. Moreover, most of these ceased defaulters were written down in a short period of time. They represent a more risky set of defaulters in the entire defaulter universe. Defaulters still making payments are likely to suffer lower losses than those of ceased defaulters. Additional information may be gleaned from studying losses to date for all payment defaults, recognizing though that losses are still accumulating for many defaults and some defaults have been cured.

25. In our corporate default research, information about lifetime cumulative loss rate is easier to obtain for two reasons. Corporate defaults usually lead to bankruptcy, which are typically resolved within about two years. Second, trading prices for defaulted corporate debt are often widely available and many studies have shown that trading prices one month after default are good proxies for ultimate recoveries.

26. Strictly speaking, those defaulters cured within a short horizon suffered minor losses when the present value of the payments is considered, if the repayment did not include interest on interest shortfalls.

Figure 24 provides mean loss severity rates and other sample statistics at four distinct seasoning horizons: 24 months, 48 months, 72 months and 96 months after origination as of year-end 2002. The averages in Figure 24 are calculated using all and only defaulters outstanding at those seasoning horizons. Naturally, there are more defaulters in shorter seasoning horizons. Figure 24 includes loss severity rates and some descriptive statistics for payment defaults that are still making payments, all payment defaults and the 84 defaulters that had zero outstanding balances.

According to Figure 24, mean loss severity rates of all payment defaults have been similar for ABS and RMBS defaults, while CMBS defaults sustained much lower loss severity rates to date. Loss severities to date from payment defaults that are still making payments are much lower than lifetime loss severity rate based on the smaller sample of 84 securities. For example, there are 46 payment defaulters already seasoned for 96 months. Their average loss severity rate to date has been only 12.93%, as compared to a 42% severity rate for defaulters that were no longer making payments. Further, the median loss severity rate to date is only 4.93% for these 46 defaulters.

**Figure 24 - Descriptive Statistics Of Loss Severity Rates By Sector, 1993-2002**

|      |         | Payment Defaults With<br>Zero Outstanding Balance | Payment Defaults That Are Still Making<br>Payments As Of Year-End 2002 |        |        |        | All Payment Defaults Included |        |        |        |
|------|---------|---|--|--------|--------|--------|-------------------------------|--------|--------|--------|
|      |         | (84 In Total)                                     | (306 In Total)   |        |        |        | (390 In Total)                |        |        |        |
|      |         |   | Months After Origination   |        |        |        | Months After Origination      |        |        |        |
|      |         | Lifetime  | 24   | 48     | 72     | 96     | 24                            | 48     | 72     | 96     |
| ALL  | Median  | 44.12%  | 0.00%  | 0.00%  | 2.33%  | 4.93%  | 0.00%                         | 0.25%  | 11.10% | 21.46% |
|      | Mean    | 42.17%  | 0.13%  | 4.68%  | 11.11% | 12.93% | 0.55%                         | 13.20% | 24.29% | 32.78% |
|      | Std Dev | 33.07%  | 0.61%  | 10.06% | 14.86% | 16.15% | 4.65%                         | 24.18% | 28.85% | 31.43% |
|      | 90%ile  | 81.25%  | 0.00%  | 15.94% | 33.22% | 36.86% | 0.01%                         | 61.40% | 76.31% | 78.48% |
|      | Counts  | 84  | 300  | 233    | 113    | 46     | 384                           | 315    | 193    | 126    |
| ABS  | Median  | 39.83%  | 0.00%  | 0.00%  | 0.00%  | 0.02%  | 0.00%                         | 0.04%  | 1.82%  | 23.81% |
|      | Mean    | 40.57%  | 0.17%  | 4.58%  | 5.69%  | 0.46%  | 0.78%                         | 9.61%  | 18.37% | 33.88% |
|      | Std Dev | 32.99%  | 0.61%  | 9.52%  | 11.32% | 0.91%  | 6.74%                         | 18.88% | 27.39% | 33.65% |
|      | 90%ile  | 78.66%  | 0.37%  | 15.76% | 26.03% | 1.29%  | 0.58%                         | 32.89% | 65.80% | 78.08% |
|      | Counts  | 20  | 145  | 110    | 35     | 4      | 165                           | 130    | 55     | 24     |
| CMBS | Median  | 0.00%   | 0.00%  | 0.01%  | 0.00%  | 0.00%  | 0.00%                         | 0.01%  | 0.00%  | 0.00%  |
|      | Mean    | 0.00%   | 0.01%  | 0.77%  | 0.03%  | 0.00%  | 0.01%                         | 0.70%  | 0.03%  | 0.00%  |
|      | Std Dev | 0.00%   | 0.06%  | 1.59%  | 0.08%  | 0.00%  | 0.06%                         | 1.53%  | 0.08%  | 0.00%  |
|      | 90%ile  | 0.00%   | 0.00%  | 3.85%  | 0.10%  | 0.00%  | 0.00%                         | 3.26%  | 0.10%  | 0.00%  |
|      | Counts  | 4   | 72   | 40     | 6      | 4      | 76                            | 44     | 6      | 4      |
| RMBS | Median  | 53.07%  | 0.00%  | 0.00%  | 5.99%  | 6.23%  | 0.00%                         | 5.49%  | 16.56% | 20.08% |
|      | Mean    | 45.51%  | 0.15%  | 6.70%  | 13.90% | 14.12% | 0.57%                         | 20.13% | 27.04% | 32.52% |
|      | Std Dev | 32.48%  | 0.83%  | 12.36% | 15.71% | 16.42% | 2.38%                         | 29.37% | 29.21% | 31.06% |
|      | 90%ile  | 81.27%  | 0.00%  | 20.85% | 34.48% | 38.90% | 0.00%                         | 77.07% | 76.83% | 78.65% |
|      | Counts  | 60  | 83   | 83     | 76     | 42     | 143                           | 143    | 136    | 102    |

### Loss Severity Rates By Original Rating

When payment shortfalls occur, junior tranches are the first to suffer. Losses then gradually climb up the waterfall to impact mezzanine or even senior tranches as losses continue to accumulate. It is therefore natural to expect loss severity rates to be lower for senior tranches and higher for junior tranches. Also, senior tranches tend to be bigger, so a given dollar loss is less severe per tranche. Although we have not organized the data set in a way that makes senior/subordinated status explicit, original ratings provide a reasonable approximation because in a multiple-tranche deal senior tranches are often rated Aaa, mezzanine tranches are rated Aa or A and junior tranches are rated Baa or below.

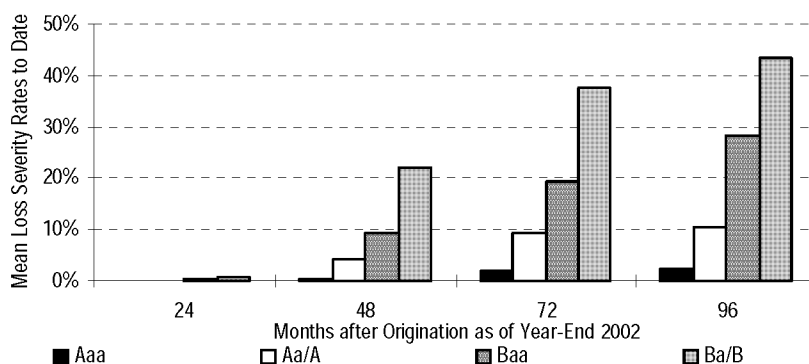
Figure 25 provides mean loss severity rates to date at four seasoning horizons for four original rating buckets<sup>27</sup> (for ease of comparison, Aa and A ratings have been combined into one bucket, and Ba and B ratings have been combined into another bucket). The four original rating buckets correspond to four loss priority levels in a standard structured transaction. We have chosen to plot only up to the eighth year since origination because our sample period is only ten-year long and the number of observations declines quickly as the time horizon extends. For instance, by the 24<sup>th</sup> month after origination, there were 61 defaulters originally rated Aa/A and 167 defaulters originally rated Ba/B. But by the 96<sup>th</sup> month after origination, only 20 defaulters were left in the Aa/A original rating bucket and 59 were left in the Ba/B original rating bucket.

Figure 25 shows that loss severity rates are strongly correlated with original ratings with the higher the original rating, the lower the loss severity rate, and at all four seasoning horizons. For instance, average cumulative loss severity rates realized to date from defaulters originated 72 months after origination as of year-end 2002, are 37.64% for Ba or B, 19.53% for Baa, 9.12% for Aa or A, and 1.96%, for Aaa defaulters.<sup>28</sup> Since differences in original ratings are closely related to seniority in a deal's capital structure, these results also suggest that, as expected, junior tranches have suffered much higher loss severity rates than senior tranches.

27. There were five defaulters originally rated Caa. None of them suffered material losses.

28. The number of observations available for computing average loss rates decreases with the length of seasoning. This is shown in Figure 24.

**Figure 25 - Mean Loss Severity Rates To Date Of All Payment Defaults By Original Rating And Months After Origination, 1993-2002**



## Concluding Remarks

Moody's assigns structured ratings on the basis of expected loss rates, which are the product of two rates, that is the rate of default and the rate of loss severity given default. This special comment has closely examined the first of the two, the default rate, and briefly analyzed the second, the loss severity rate.

Our examination of defaults and default rates over a ten-year period for the U.S. ABS, CMBS and RMBS structured rating universe reveals a strong inverse correlation between ratings and default rates over one-year and multi-year horizons. We found payment defaults were sometimes cured and did not result in material losses to investors, although the majority of payment defaults were not cured. Material impairments that consist of uncured payment defaults and anticipated future defaults (Ca/C-rated securities) have been strongly inversely correlated with Moody's ratings as well.

Different structured finance sectors have experienced different default rates over the past ten years. Recently default rates have been particularly high in the ABS sector, driven mainly by defaults in the manufactured housing, franchise loans, and home equity loan sectors. The weak economy in the past two years as well as the current servicer advancing mechanisms have also impacted the CMBS sector, resulting in interest shortfalls to a number of CMBS securities.

Many of these CMBS payment defaults were quickly cured and suffered no permanent losses. However, the CMBS sector normally lags the performance of the corporate sector, and more defaults are expected as loan delinquencies and defaults continue picking up after the end of 2002. Additionally, many asset types in structured finance have either sustained only one credit cycle and some even less than one cycle, and thus the differences we have observed in a short ten-year period may not necessarily persist into the future.

Lifetime cumulative loss severity rates among defaulters that have had zero outstanding balances have averaged around 42%, although the variance among them has been very large.<sup>29</sup> Because the large majority of these defaulters that were no longer making payments were written down, their loss experience is likely to turn out to be more severe than the ultimate loss experience of other defaulters that still have positive balances and have not yet reached their final maturity dates.

Therefore, the estimate of loss severity rate after all defaulters' losses become final may turn out to be considerably lower. In fact, for those defaulters that were still making payments at the end of our sample period, average loss severity rate to date as a percentage of original balance has been less than 13%. An in-depth study of loss rates on defaulted securities will be presented in a future special comment.

29. Corporate loss severity estimates cannot be compared directly against structured finance loss severity estimates because corporate securities are typically par bonds and many structured securities are amortizing bonds.



## Appendix I: Number Of Defaults, Impairments And Outstanding Rating Observations From 1993 To 2002

**Figure 26 - Number Of Defaults And Impairments By Year And Sector, 1993-2002**

|   | Year        | ALL        | ABS        | CMBS        | RMBS        |
|---|-------------|------------|------------|-------------|-------------|
|   | 1993        |            |            |             |             |
|   | 1994        |            |            |             |             |
|   | 1995        |            |            |             |             |
| <b>All Payment Default:</b>   | 1996        | 16         | 2          |             | 14          |
| Cured payment default + Uncured payment default                                   | 1997        | 37         | 2          |             | 35          |
|   | 1998        | 38         | 11         | 4           | 23          |
|   | 1999        | 52         | 12         | 1           | 39          |
|   | 2000        | 43         | 20         | 4           | 19          |
|   | 2001        | 82         | 55         | 19          | 8           |
|   | 2002        | 122        | 65         | 52          | 5           |
|   | Total       | 390        | 167        | 80          | 143         |
|   | <b>Year</b> | <b>ALL</b> | <b>ABS</b> | <b>CMBS</b> | <b>RMBS</b> |
|   | 1993        |            |            |             |             |
|   | 1994        | 1          |            | 1           |             |
|   | 1995        |            |            |             |             |
| <b>All Ca/C rated:</b>  | 1996        | 9          |            |             | 9           |
| All Ca or C rated securities regardless of whether or not it is a payment default | 1997        |            |            |             |             |
|   | 1998        | 31         | 1          |             | 30          |
|   | 1999        | 33         | 8          |             | 25          |
|   | 2000        | 12         | 12         |             |             |
|   | 2001        | 16         | 15         | 1           |             |
|   | 2002        | 66         | 63         | 3           |             |
|   | Total       | 168        | 99         | 5           | 64          |
|   | <b>Year</b> | <b>ALL</b> | <b>ABS</b> | <b>CMBS</b> | <b>RMBS</b> |
|   | 1993        |            |            |             |             |
|   | 1994        | 1          |            | 1           |             |
|   | 1995        |            |            |             |             |
| <b>Material Impairment:</b>   | 1996        | 17         | 2          |             | 15          |
| Uncured payment default+ Ca/C rated but not in payment default                    | 1997        | 36         | 2          |             | 34          |
|   | 1998        | 28         | 6          |             | 22          |
|   | 1999        | 50         | 17         |             | 33          |
|   | 2000        | 35         | 24         | 3           | 8           |
|   | 2001        | 67         | 51         | 11          | 5           |
|   | 2002        | 92         | 72         | 16          | 4           |
|   | Total       | 326        | 174        | 31          | 121         |

**Figure 27 - Counts Of Material Impairments By Original Rating And Year Since Origination**

| Original Rating | Total Counts | Counts Of Material Impairments By Years Since Origination |    |    |    |    |    |   |   |   | Counts Of Withdrawn Ratings By Years Since Origination |    |     |     |     |     |     |     |     |
|-----------------|--------------|---|----|----|----|----|----|---|---|---|--|----|-----|-----|-----|-----|-----|-----|-----|
|                 |              | 1   | 2  | 3  | 4  | 5  | 6  | 7 | 8 | 9 | 1  | 2  | 3   | 4   | 5   | 6   | 7   | 8   | 9   |
| <b>ALL</b>      | <b>13419</b> |   |    |    |    |    |    |   |   |   |  |    |     |     |     |     |     |     |     |
| Aaa             | 4028         | 0   | 0  | 1  | 5  | 3  | 1  | 0 | 0 | 0 | 23   | 51 | 180 | 294 | 408 | 417 | 396 | 276 | 134 |
| Aa              | 2227         | 12  | 6  | 7  | 8  | 2  | 0  | 0 | 0 | 0 | 22   | 41 | 65  | 83  | 98  | 115 | 143 | 121 | 80  |
| A               | 2969         | 1   | 9  | 9  | 5  | 1  | 0  | 0 | 0 | 0 | 14   | 37 | 107 | 164 | 222 | 234 | 209 | 132 | 58  |
| Baa             | 2684         | 7   | 22 | 31 | 28 | 14 | 11 | 4 | 2 | 2 | 15   | 43 | 49  | 74  | 74  | 82  | 74  | 51  | 26  |
| Ba              | 927          | 4   | 19 | 24 | 13 | 5  | 6  | 0 | 0 | 0 | 10   | 18 | 23  | 26  | 16  | 24  | 27  | 19  | 13  |
| B               | 558          | 5   | 18 | 27 | 8  | 4  | 0  | 0 | 0 | 0 | 5  | 7  | 15  | 13  | 7   | 7   | 13  | 11  | 7   |
| Caa             | 26           | 1   | 0  | 1  | 0  | 0  | 0  | 0 | 0 | 0 | 2  | 2  | 3   | 2   | 0   | 0   | 0   | 0   | 0   |
| <b>ABS</b>      | <b>6522</b>  |   |    |    |    |    |    |   |   |   |  |    |     |     |     |     |     |     |     |
| Aaa             | 2281         | 0   | 0  | 1  | 0  | 0  | 0  | 0 | 0 | 0 | 6  | 21 | 130 | 232 | 326 | 329 | 287 | 181 | 79  |
| Aa              | 929          | 12  | 6  | 3  | 4  | 1  | 0  | 0 | 0 | 0 | 4  | 8  | 14  | 33  | 40  | 39  | 34  | 26  | 7   |
| A               | 1868         | 1   | 8  | 7  | 4  | 0  | 0  | 0 | 0 | 0 | 9  | 19 | 80  | 139 | 203 | 210 | 170 | 105 | 37  |
| Baa             | 1184         | 3   | 13 | 11 | 17 | 7  | 10 | 3 | 1 | 1 | 6  | 8  | 16  | 34  | 45  | 49  | 33  | 20  | 6   |
| Ba              | 215          | 3   | 15 | 12 | 8  | 3  | 2  | 0 | 0 | 0 | 4  | 7  | 9   | 8   | 6   | 4   | 2   | 0   | 0   |
| B               | 43           | 3   | 8  | 4  | 2  | 0  | 0  | 0 | 0 | 0 | 0  | 0  | 0   | 0   | 0   | 0   | 1   | 0   | 0   |
| Caa             | 2            | 1   | 0  | 0  | 0  | 0  | 0  | 0 | 0 | 0 | 0  | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 0   |
| <b>CMBS</b>     | <b>2614</b>  |   |    |    |    |    |    |   |   |   |  |    |     |     |     |     |     |     |     |
| Aaa             | 332          | 0   | 0  | 0  | 0  | 0  | 0  | 0 | 0 | 0 | 7  | 17 | 25  | 23  | 20  | 16  | 20  | 17  | 6   |
| Aa              | 390          | 0   | 0  | 0  | 0  | 0  | 0  | 0 | 0 | 0 | 13   | 28 | 39  | 34  | 28  | 28  | 29  | 27  | 15  |
| A               | 464          | 0   | 0  | 0  | 1  | 0  | 0  | 0 | 0 | 0 | 4  | 15 | 23  | 20  | 12  | 12  | 16  | 13  | 8   |
| Baa             | 747          | 1   | 2  | 1  | 2  | 0  | 0  | 0 | 0 | 0 | 8  | 34 | 30  | 33  | 19  | 18  | 20  | 18  | 11  |
| Ba              | 348          | 1   | 0  | 4  | 1  | 0  | 0  | 0 | 0 | 0 | 5  | 9  | 11  | 15  | 7   | 10  | 13  | 12  | 8   |
| B               | 310          | 1   | 3  | 10 | 1  | 2  | 0  | 0 | 0 | 0 | 5  | 7  | 15  | 13  | 7   | 5   | 11  | 9   | 5   |
| Caa             | 23           | 0   | 0  | 1  | 0  | 0  | 0  | 0 | 0 | 0 | 2  | 2  | 3   | 2   | 0   | 0   | 0   | 0   | 0   |
| <b>RMBS</b>     | <b>4283</b>  |   |    |    |    |    |    |   |   |   |  |    |     |     |     |     |     |     |     |
| Aaa             | 1415         | 0   | 0  | 0  | 5  | 3  | 1  | 0 | 0 | 0 | 10   | 13 | 25  | 39  | 62  | 72  | 89  | 78  | 49  |
| Aa              | 908          | 0   | 0  | 4  | 4  | 1  | 0  | 0 | 0 | 0 | 5  | 5  | 12  | 16  | 30  | 48  | 80  | 68  | 58  |
| A               | 637          | 0   | 1  | 2  | 0  | 1  | 0  | 0 | 0 | 0 | 1  | 3  | 4   | 5   | 7   | 12  | 23  | 14  | 13  |
| Baa             | 753          | 3   | 7  | 19 | 9  | 7  | 1  | 1 | 1 | 1 | 1  | 1  | 3   | 7   | 10  | 15  | 21  | 13  | 9   |
| Ba              | 364          | 0   | 4  | 8  | 4  | 2  | 4  | 0 | 0 | 0 | 1  | 2  | 3   | 3   | 3   | 10  | 12  | 7   | 5   |
| B               | 205          | 1   | 7  | 13 | 5  | 2  | 0  | 0 | 0 | 0 | 0  | 0  | 0   | 0   | 0   | 2   | 1   | 2   | 2   |
| Caa             | 1            | 0   | 0  | 0  | 0  | 0  | 0  | 0 | 0 | 0 | 0  | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 0   |

**Figure 28 - Number Of Outstanding Securities By Rating At The Beginning Of Each Year**

| <b>ALL</b>  | <b>1994</b> | <b>1995</b> | <b>1996</b> | <b>1997</b> | <b>1998</b> | <b>1999</b> | <b>2000</b> | <b>2001</b> | <b>2002</b> |
|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Aaa         | 309         | 590         | 854         | 1115        | 1437        | 1783        | 2082        | 2351        | 2834        |
| Aa          | 207         | 394         | 566         | 618         | 761         | 836         | 958         | 1090        | 1347        |
| A           | 96          | 246         | 463         | 662         | 870         | 1099        | 1331        | 1565        | 1922        |
| Baa         | 89          | 252         | 426         | 533         | 733         | 875         | 1081        | 1213        | 1627        |
| Ba          | 28          | 83          | 176         | 238         | 281         | 403         | 389         | 509         | 639         |
| B           | 22          | 53          | 87          | 102         | 140         | 201         | 247         | 302         | 379         |
| Caa         | 1           | 1           | 1           | 7           | 6           | 16          | 52          | 50          | 60          |
| Ca/C        |             | 1           |             | 8           | 4           | 30          | 50          | 56          | 67          |
| <b>ABS</b>  | <b>1994</b> | <b>1995</b> | <b>1996</b> | <b>1997</b> | <b>1998</b> | <b>1999</b> | <b>2000</b> | <b>2001</b> | <b>2002</b> |
| Aaa         | 89          | 208         | 375         | 549         | 725         | 932         | 1104        | 1254        | 1455        |
| Aa          | 12          | 44          | 80          | 113         | 194         | 300         | 387         | 508         | 635         |
| A           | 47          | 129         | 242         | 374         | 523         | 687         | 858         | 1030        | 1205        |
| Baa         | 11          | 46          | 98          | 160         | 272         | 337         | 472         | 536         | 683         |
| Ba          | 2           | 3           | 9           | 20          | 49          | 133         | 99          | 179         | 218         |
| B           |             |             | 2           | 4           | 12          | 30          | 38          | 52          | 56          |
| Caa         |             |             |             |             |             | 1           | 14          | 11          | 19          |
| Ca/C        |             |             |             |             |             | 1           | 9           | 20          | 33          |
| <b>CMBS</b> | <b>1994</b> | <b>1995</b> | <b>1996</b> | <b>1997</b> | <b>1998</b> | <b>1999</b> | <b>2000</b> | <b>2001</b> | <b>2002</b> |
| Aaa         | 7           | 19          | 23          | 34          | 67          | 109         | 173         | 215         | 285         |
| Aa          | 16          | 27          | 33          | 45          | 74          | 109         | 168         | 206         | 260         |
| A           | 11          | 19          | 23          | 33          | 62          | 109         | 174         | 237         | 332         |
| Baa         | 12          | 23          | 29          | 42          | 91          | 167         | 245         | 332         | 512         |
| Ba          | 8           | 13          | 17          | 20          | 32          | 71          | 113         | 156         | 223         |
| B           | 5           | 10          | 13          | 16          | 30          | 63          | 111         | 153         | 210         |
| Caa         |             |             |             |             | 1           | 7           | 15          | 16          | 20          |
| Ca/C        |             | 1           |             |             |             |             |             |             | 1           |
| <b>RMBS</b> | <b>1994</b> | <b>1995</b> | <b>1996</b> | <b>1997</b> | <b>1998</b> | <b>1999</b> | <b>2000</b> | <b>2001</b> | <b>2002</b> |
| Aaa         | 213         | 363         | 456         | 532         | 645         | 742         | 805         | 882         | 1094        |
| Aa          | 179         | 323         | 453         | 460         | 493         | 427         | 403         | 376         | 452         |
| A           | 38          | 98          | 198         | 255         | 285         | 303         | 299         | 298         | 385         |
| Baa         | 66          | 183         | 299         | 331         | 370         | 371         | 364         | 345         | 432         |
| Ba          | 18          | 67          | 150         | 198         | 200         | 199         | 177         | 174         | 198         |
| B           | 17          | 43          | 72          | 82          | 98          | 108         | 98          | 97          | 113         |
| Caa         | 1           | 1           | 1           | 7           | 5           | 8           | 23          | 23          | 21          |
| Ca/C        |             |             |             | 8           | 4           | 29          | 41          | 36          | 33          |

## Appendix II: Material Impairment Rates By Rating And Sector

**Figure 29 - Material Impairments Rates By Cohort Rating And Sector, 1994-2002**

| All         | Time Horizons (Years Since Cohorts Formed) |          |          |          |          |
|-------------|--|----------|----------|----------|----------|
|             | 1  | 2        | 3        | 4        | 5        |
| Aaa         | 0.01%                                      | 0.08%    | 0.23%    | 0.42%    | 0.56%    |
| Aa          | 0.24%                                      | 0.47%    | 0.80%    | 1.13%    | 1.23%    |
| A           | 0.27%                                      | 0.79%    | 1.20%    | 1.42%    | 1.48%    |
| Baa         | 0.99%                                      | 2.53%    | 5.01%    | 6.49%    | 8.36%    |
| Ba          | 3.95%                                      | 9.05%    | 12.37%   | 16.48%   | 17.95%   |
| B           | 5.58%                                      | 11.78%   | 16.87%   | 19.18%   | 20.35%   |
| Caa         | 23.58%                                     | 26.33%   | 28.79%   | 28.79%   | 28.79%   |
| <b>ABS</b>  | <b>1</b>                                   | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> |
| Aaa         | 0.00%                                      | 0.02%    | 0.06%    | 0.06%    | 0.06%    |
| Aa          | 0.67%                                      | 1.25%    | 2.03%    | 2.83%    | 3.13%    |
| A           | 0.30%                                      | 0.85%    | 1.32%    | 1.61%    | 1.61%    |
| Baa         | 1.14%                                      | 2.88%    | 6.74%    | 8.85%    | 13.44%   |
| Ba          | 9.44%                                      | 23.47%   | 31.66%   | 47.50%   | 53.08%   |
| B           | 15.97%                                     | 36.00%   | 44.44%   | 49.38%   | 49.38%   |
| Caa         | 70.83%                                     | 70.83%   | 70.83%   | NA       | NA       |
| <b>CMBS</b> | <b>1</b>                                   | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> |
| Aaa         | 0.00%                                      | 0.00%    | 0.00%    | 0.00%    | 0.00%    |
| Aa          | 0.00%                                      | 0.00%    | 0.00%    | 0.00%    | 0.00%    |
| A           | 0.10%                                      | 0.26%    | 0.53%    | 1.03%    | 1.03%    |
| Baa         | 0.42%                                      | 0.99%    | 1.55%    | 2.23%    | 2.23%    |
| Ba          | 0.94%                                      | 2.20%    | 4.33%    | 5.17%    | 5.17%    |
| B           | 2.86%                                      | 7.07%    | 12.92%   | 15.68%   | 19.43%   |
| Caa         | 1.85%                                      | 4.70%    | 9.85%    | 9.85%    | 9.85%    |
| <b>RMBS</b> | <b>1</b>                                   | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> |
| Aaa         | 0.02%                                      | 0.15%    | 0.42%    | 0.76%    | 0.97%    |
| Aa          | 0.03%                                      | 0.13%    | 0.32%    | 0.55%    | 0.61%    |
| A           | 0.28%                                      | 0.86%    | 1.21%    | 1.30%    | 1.42%    |
| Baa         | 1.14%                                      | 2.90%    | 5.00%    | 6.30%    | 7.25%    |
| Ba          | 2.64%                                      | 5.31%    | 7.31%    | 8.61%    | 9.65%    |
| B           | 5.56%                                      | 10.29%   | 14.52%   | 16.42%   | 17.17%   |
| Caa         | 24.66%                                     | 28.52%   | 28.52%   | 28.52%   | 28.52%   |

Note: Numbers in italics indicate that the denominator of this rate is less than or equal to 30.

**Figure 30 - Material Impairments Rates By Original Rating And Sector, 1993-2002**

|             | Counts       | Time Horizon (Years After Origination) |               |               |               |               |
|-------------|--------------|--|---------------|---------------|---------------|---------------|
|             |              | 1                                      | 2             | 3             | 4             | 5             |
| <b>ALL</b>  | <b>13419</b> |  |               |               |               |               |
| Aaa         | 4028         | 0.00%                                  | 0.00%         | 0.03%         | 0.16%         | 0.24%         |
| Aa          | 2227         | 0.54%                                  | 0.81%         | 1.14%         | 1.51%         | 1.60%         |
| A           | 2969         | 0.03%                                  | 0.34%         | 0.65%         | 0.83%         | 0.86%         |
| Baa         | 2684         | 0.26%                                  | 1.09%         | 2.27%         | 3.33%         | 3.87%         |
| Ba          | 927          | 0.43%                                  | 2.51%         | 5.16%         | 6.60%         | 7.16%         |
| B           | 558          | 0.90%                                  | 4.16%         | 9.10%         | 10.57%        | 11.30%        |
| Caa         | 26           | <i>4.00%</i>                           | <i>4.00%</i>  | <i>8.27%</i>  | <i>8.27%</i>  | <i>8.27%</i>  |
| <b>ABS</b>  | <b>6522</b>  |  |               |               |               |               |
| Aaa         | 2281         | 0.00%                                  | 0.00%         | 0.05%         | 0.05%         | 0.05%         |
| Aa          | 929          | 1.29%                                  | 1.94%         | 2.27%         | 2.71%         | 2.83%         |
| A           | 1868         | 0.05%                                  | 0.49%         | 0.87%         | 1.10%         | 1.10%         |
| Baa         | 1184         | 0.25%                                  | 1.36%         | 2.30%         | 3.76%         | 4.38%         |
| Ba          | 215          | 1.41%                                  | 8.57%         | 14.38%        | 18.26%        | 19.70%        |
| B           | 43           | 6.98%                                  | 25.58%        | 34.88%        | 39.53%        | 39.53%        |
| Caa         | 2            | <i>50.00%</i>                          | <i>50.00%</i> | <i>50.00%</i> | <i>50.00%</i> | <i>50.00%</i> |
| <b>CMBS</b> | <b>2614</b>  |  |               |               |               |               |
| Aaa         | 332          | 0.00%                                  | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| Aa          | 390          | 0.00%                                  | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| A           | 464          | 0.00%                                  | 0.00%         | 0.00%         | 0.23%         | 0.23%         |
| Baa         | 747          | 0.13%                                  | 0.41%         | 0.55%         | 0.83%         | 0.83%         |
| Ba          | 348          | 0.29%                                  | 0.29%         | 1.47%         | 1.77%         | 1.77%         |
| B           | 310          | 0.33%                                  | 1.31%         | 4.66%         | 5.00%         | 5.66%         |
| Caa         | 23           | <i>0.00%</i>                           | <i>0.00%</i>  | <i>4.88%</i>  | <i>4.88%</i>  | <i>4.88%</i>  |
| <b>RMBS</b> | <b>4283</b>  |  |               |               |               |               |
| Aaa         | 1415         | 0.00%                                  | 0.00%         | 0.00%         | 0.36%         | 0.58%         |
| Aa          | 908          | 0.00%                                  | 0.00%         | 0.44%         | 0.89%         | 1.01%         |
| A           | 637          | 0.00%                                  | 0.16%         | 0.47%         | 0.47%         | 0.63%         |
| Baa         | 753          | 0.40%                                  | 1.33%         | 3.86%         | 5.06%         | 6.00%         |
| Ba          | 364          | 0.00%                                  | 1.10%         | 3.32%         | 4.42%         | 4.98%         |
| B           | 205          | 0.49%                                  | 3.90%         | 10.24%        | 12.68%        | 13.66%        |
| Caa         | 1            |  |               |               |               |               |

Note: Numbers in italics indicate that the denominator of this rate is less than or equal to 30.

## Appendix III: Payment Default Rates By Rating And Sector

**Figure 31 - Payment Defaults Rates By Cohort Rating And Sector, 1994-2002**

| All         | Time Horizons (Years Since Cohorts Formed) |          |          |          |          |
|-------------|--|----------|----------|----------|----------|
|             | 1  | 2        | 3        | 4        | 5        |
| Aaa         | 0.06%                                      | 0.19%    | 0.37%    | 0.60%    | 0.74%    |
| Aa          | 0.23%                                      | 0.59%    | 1.20%    | 1.93%    | 2.35%    |
| A           | 0.32%                                      | 0.84%    | 1.20%    | 1.46%    | 1.76%    |
| Baa         | 1.28%                                      | 3.17%    | 6.06%    | 8.19%    | 10.28%   |
| Ba          | 4.36%                                      | 9.88%    | 13.38%   | 17.90%   | 19.34%   |
| B           | 7.34%                                      | 15.46%   | 23.04%   | 27.19%   | 28.79%   |
| Caa         | 22.54%                                     | 33.50%   | 44.59%   | 58.44%   | 58.44%   |
| <b>ABS</b>  | <b>1</b>                                   | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> |
| Aaa         | 0.00%                                      | 0.02%    | 0.09%    | 0.14%    | 0.14%    |
| Aa          | 0.45%                                      | 1.10%    | 2.08%    | 3.37%    | 3.97%    |
| A           | 0.30%                                      | 0.76%    | 1.06%    | 1.28%    | 1.54%    |
| Baa         | 1.41%                                      | 3.44%    | 7.63%    | 10.25%   | 14.90%   |
| Ba          | 9.47%                                      | 22.91%   | 29.57%   | 45.98%   | 50.35%   |
| B           | 16.84%                                     | 36.40%   | 50.98%   | 61.19%   | 61.19%   |
| Caa         | 41.67%                                     | 55.39%   | 55.39%   | 55.39%   | NA       |
| <b>CMBS</b> | <b>1</b>                                   | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> |
| Aaa         | 0.11%                                      | 0.29%    | 0.59%    | 1.14%    | 1.14%    |
| Aa          | 0.33%                                      | 0.84%    | 1.11%    | 1.61%    | 1.61%    |
| A           | 0.31%                                      | 0.63%    | 0.90%    | 1.41%    | 1.41%    |
| Baa         | 0.92%                                      | 2.07%    | 3.56%    | 5.94%    | 5.94%    |
| Ba          | 2.68%                                      | 6.41%    | 11.38%   | 15.41%   | 17.08%   |
| B           | 6.27%                                      | 14.97%   | 25.39%   | 32.61%   | 35.68%   |
| Caa         | 9.62%                                      | 23.52%   | 46.70%   | 82.23%   | NA       |
| <b>RMBS</b> | <b>1</b>                                   | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> |
| Aaa         | 0.12%                                      | 0.35%    | 0.61%    | 0.96%    | 1.17%    |
| Aa          | 0.06%                                      | 0.26%    | 0.75%    | 1.36%    | 1.77%    |
| A           | 0.37%                                      | 1.07%    | 1.56%    | 1.83%    | 2.19%    |
| Baa         | 1.33%                                      | 3.41%    | 5.82%    | 7.65%    | 8.94%    |
| Ba          | 2.65%                                      | 5.50%    | 7.61%    | 8.90%    | 9.94%    |
| B           | 6.19%                                      | 11.65%   | 16.73%   | 19.15%   | 20.63%   |
| Caa         | 29.51%                                     | 34.06%   | 34.06%   | 34.06%   | 34.06%   |

Note: Numbers in italics indicate that the denominator of this rate is less than or equal to 30.

**Figure 32 - Payment Defaults Rates By Original Rating And Sector, 1993-2002**

|             | Counts       | Time Horizon (Years After Origination) |               |               |               |               |
|-------------|--------------|--|---------------|---------------|---------------|---------------|
|             |              | 1                                      | 2             | 3             | 4             | 5             |
| <b>ALL</b>  | <b>13419</b> |  |               |               |               |               |
| Aaa         | 4028         | 0.00%                                  | 0.00%         | 0.03%         | 0.21%         | 0.29%         |
| Aa          | 2227         | 0.05%                                  | 0.36%         | 0.64%         | 1.24%         | 1.43%         |
| A           | 2969         | 0.07%                                  | 0.31%         | 0.51%         | 0.69%         | 0.80%         |
| Baa         | 2684         | 0.34%                                  | 1.20%         | 2.38%         | 3.90%         | 4.56%         |
| Ba          | 927          | 0.54%                                  | 3.06%         | 5.60%         | 7.59%         | 8.04%         |
| B           | 558          | 1.80%                                  | 6.15%         | 12.73%        | 15.49%        | 16.22%        |
| Caa         | 26           | <i>4.00%</i>                           | <i>4.00%</i>  | <i>16.80%</i> | <i>25.33%</i> | <i>25.33%</i> |
| <b>ABS</b>  | <b>6522</b>  |  |               |               |               |               |
| Aaa         | 2281         | 0.00%                                  | 0.00%         | 0.05%         | 0.09%         | 0.09%         |
| Aa          | 929          | 0.11%                                  | 0.65%         | 0.87%         | 1.53%         | 1.64%         |
| A           | 1868         | 0.05%                                  | 0.32%         | 0.54%         | 0.71%         | 0.83%         |
| Baa         | 1184         | 0.25%                                  | 1.44%         | 2.38%         | 4.19%         | 4.81%         |
| Ba          | 215          | 1.41%                                  | 8.57%         | 12.44%        | 17.29%        | 18.73%        |
| B           | 43           | <i>11.63%</i>                          | <i>30.23%</i> | <i>44.19%</i> | <i>51.16%</i> | <i>51.16%</i> |
| Caa         | 2            | <i>50.00%</i>                          | <i>50.00%</i> | <i>50.00%</i> | <i>50.00%</i> | <i>50.00%</i> |
| <b>CMBS</b> | <b>2614</b>  |  |               |               |               |               |
| Aaa         | 332          | 0.00%                                  | 0.00%         | 0.00%         | 0.32%         | 0.32%         |
| Aa          | 390          | 0.00%                                  | 0.54%         | 0.54%         | 0.82%         | 0.82%         |
| A           | 464          | 0.22%                                  | 0.44%         | 0.44%         | 0.66%         | 0.66%         |
| Baa         | 747          | 0.40%                                  | 0.68%         | 0.82%         | 1.80%         | 1.80%         |
| Ba          | 348          | 0.58%                                  | 1.46%         | 3.53%         | 4.72%         | 4.72%         |
| B           | 310          | 1.30%                                  | 4.26%         | 9.62%         | 11.98%        | 12.65%        |
| Caa         | 23           | <i>0.00%</i>                           | <i>0.00%</i>  | <i>14.63%</i> | <i>24.39%</i> | <i>24.39%</i> |
| <b>RMBS</b> | <b>4283</b>  |  |               |               |               |               |
| Aaa         | 1415         | 0.00%                                  | 0.00%         | 0.00%         | 0.36%         | 0.58%         |
| Aa          | 908          | 0.00%                                  | 0.00%         | 0.44%         | 1.12%         | 1.45%         |
| A           | 637          | 0.00%                                  | 0.16%         | 0.47%         | 0.63%         | 0.79%         |
| Baa         | 753          | 0.40%                                  | 1.33%         | 3.86%         | 5.46%         | 6.81%         |
| Ba          | 364          | 0.00%                                  | 1.38%         | 3.59%         | 4.70%         | 4.98%         |
| B           | 205          | 0.49%                                  | 3.90%         | 10.73%        | 13.17%        | 14.15%        |
| Caa         | 1            |  |               |               |               |               |

Note: Numbers in italics indicate that the denominator of this rate is less than or equal to 30.

## Appendix IV: Default Rates and Impairment Rates Without Collapsing Same-Rated Tranches

**Figure 33 - Number Of Outstanding Securities By Rating At The Beginning Of Each Year  
(Including All Pari Passu/Collapsed Tranches In The Data Sample)**

| <b>ALL</b>  | <b>1994</b> | <b>1995</b> | <b>1996</b> | <b>1997</b> | <b>1998</b> | <b>1999</b> | <b>2000</b> | <b>2001</b> | <b>2002</b> |
|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Aaa         | 1957        | 2968        | 3610        | 4139        | 5383        | 5978        | 6517        | 7191        | 8541        |
| Aa          | 295         | 812         | 1420        | 1516        | 1418        | 1397        | 1450        | 1487        | 1815        |
| A           | 104         | 263         | 545         | 754         | 977         | 1250        | 1560        | 1949        | 2314        |
| Baa         | 89          | 252         | 432         | 544         | 771         | 929         | 1151        | 1305        | 1755        |
| Ba          | 28          | 84          | 177         | 240         | 288         | 414         | 402         | 523         | 666         |
| B           | 22          | 56          | 88          | 104         | 147         | 210         | 259         | 314         | 397         |
| Caa         | 1           | 1           | 1           | 7           | 6           | 16          | 54          | 53          | 62          |
| Ca/C        |             | 1           |             | 8           | 4           | 30          | 51          | 58          | 68          |
| <b>ABS</b>  | <b>1994</b> | <b>1995</b> | <b>1996</b> | <b>1997</b> | <b>1998</b> | <b>1999</b> | <b>2000</b> | <b>2001</b> | <b>2002</b> |
| Aaa         | 195         | 369         | 682         | 1009        | 1569        | 2087        | 2505        | 2859        | 3331        |
| Aa          | 31          | 87          | 131         | 176         | 262         | 374         | 509         | 686         | 917         |
| A           | 53          | 141         | 310         | 451         | 607         | 813         | 1060        | 1383        | 1561        |
| Baa         | 11          | 46          | 99          | 164         | 292         | 369         | 518         | 597         | 753         |
| Ba          | 2           | 3           | 9           | 20          | 50          | 136         | 103         | 185         | 229         |
| B           |             |             | 2           | 4           | 13          | 32          | 42          | 57          | 61          |
| Caa         |             |             |             |             |             | 1           | 14          | 12          | 19          |
| Ca/C        |             |             |             |             |             | 1           | 9           | 21          | 33          |
| <b>CMBS</b> | <b>1994</b> | <b>1995</b> | <b>1996</b> | <b>1997</b> | <b>1998</b> | <b>1999</b> | <b>2000</b> | <b>2001</b> | <b>2002</b> |
| Aaa         | 12          | 29          | 44          | 69          | 151         | 250         | 359         | 427         | 568         |
| Aa          | 32          | 42          | 50          | 61          | 90          | 118         | 178         | 218         | 275         |
| A           | 12          | 20          | 25          | 36          | 66          | 114         | 180         | 246         | 346         |
| Baa         | 12          | 23          | 29          | 44          | 96          | 175         | 254         | 348         | 555         |
| Ba          | 8           | 13          | 17          | 20          | 32          | 71          | 114         | 157         | 232         |
| B           | 5           | 13          | 14          | 17          | 31          | 64          | 111         | 153         | 217         |
| Caa         |             |             |             |             | 1           | 7           | 15          | 16          | 20          |
| Ca/C        |             | 1           |             |             |             |             |             |             | 1           |
| <b>RMBS</b> | <b>1994</b> | <b>1995</b> | <b>1996</b> | <b>1997</b> | <b>1998</b> | <b>1999</b> | <b>2000</b> | <b>2001</b> | <b>2002</b> |
| Aaa         | 1750        | 2570        | 2884        | 3061        | 3663        | 3641        | 3653        | 3905        | 4642        |
| Aa          | 232         | 683         | 1239        | 1279        | 1066        | 905         | 763         | 583         | 623         |
| A           | 39          | 102         | 210         | 267         | 304         | 323         | 320         | 320         | 407         |
| Baa         | 66          | 183         | 304         | 336         | 383         | 385         | 379         | 360         | 447         |
| Ba          | 18          | 68          | 151         | 200         | 206         | 207         | 185         | 181         | 205         |
| B           | 17          | 43          | 72          | 83          | 103         | 114         | 106         | 104         | 119         |
| Caa         | 1           | 1           | 1           | 7           | 5           | 8           | 25          | 25          | 23          |
| Ca/C        |             |             |             | 8           | 4           | 29          | 42          | 37          | 34          |



**Figure 34 - Material Impairments Rates By Cohort Rating And Sector, 1994-2002**  
**(Including All Pari Passu/Collapsed Tranches In The Data Sample)**

| ALL         | Time Horizons (Years Since Cohorts Formed) |          |          |          |          |
|-------------|--|----------|----------|----------|----------|
|             | 1  | 2        | 3        | 4        | 5        |
| Aaa         | 0.00%                                      | 0.03%    | 0.08%    | 0.14%    | 0.18%    |
| Aa          | 0.14%                                      | 0.28%    | 0.46%    | 0.64%    | 0.69%    |
| A           | 0.24%                                      | 0.68%    | 1.04%    | 1.23%    | 1.28%    |
| Baa         | 0.93%                                      | 2.42%    | 4.82%    | 6.25%    | 8.07%    |
| Ba          | 3.88%                                      | 8.92%    | 12.24%   | 16.30%   | 17.75%   |
| B           | 5.41%                                      | 11.39%   | 16.31%   | 18.56%   | 19.71%   |
| Caa         | 22.88%                                     | 25.56%   | 27.96%   | 27.96%   | 27.96%   |
| <b>ABS</b>  | <b>1</b>                                   | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> |
| Aaa         | 0.00%                                      | 0.02%    | 0.06%    | 0.06%    | 0.06%    |
| Aa          | 0.49%                                      | 0.92%    | 1.51%    | 2.11%    | 2.33%    |
| A           | 0.26%                                      | 0.69%    | 1.08%    | 1.31%    | 1.31%    |
| Baa         | 1.04%                                      | 2.70%    | 6.36%    | 8.35%    | 12.73%   |
| Ba          | 9.10%                                      | 22.76%   | 30.78%   | 46.46%   | 52.04%   |
| B           | 14.99%                                     | 33.17%   | 40.96%   | 45.59%   | 45.59%   |
| Caa         | 69.39%                                     | 69.39%   | 69.39%   | NA       | NA       |
| <b>CMBS</b> | <b>1</b>                                   | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> |
| Aaa         | 0.00%                                      | 0.00%    | 0.00%    | 0.00%    | 0.00%    |
| Aa          | 0.00%                                      | 0.00%    | 0.00%    | 0.00%    | 0.00%    |
| A           | 0.10%                                      | 0.25%    | 0.51%    | 0.98%    | 0.98%    |
| Baa         | 0.40%                                      | 0.95%    | 1.48%    | 2.14%    | 2.14%    |
| Ba          | 0.93%                                      | 2.17%    | 4.30%    | 5.14%    | 5.14%    |
| B           | 2.80%                                      | 6.97%    | 12.76%   | 15.48%   | 19.20%   |
| Caa         | 1.85%                                      | 4.70%    | 9.85%    | 9.85%    | 9.85%    |
| <b>RMBS</b> | <b>1</b>                                   | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> |
| Aaa         | 0.01%                                      | 0.04%    | 0.10%    | 0.17%    | 0.22%    |
| Aa          | 0.01%                                      | 0.06%    | 0.16%    | 0.27%    | 0.30%    |
| A           | 0.26%                                      | 0.81%    | 1.14%    | 1.22%    | 1.34%    |
| Baa         | 1.11%                                      | 2.82%    | 4.87%    | 6.15%    | 7.09%    |
| Ba          | 2.64%                                      | 5.33%    | 7.39%    | 8.66%    | 9.70%    |
| B           | 5.30%                                      | 9.83%    | 13.92%   | 15.77%   | 16.51%   |
| Caa         | 22.78%                                     | 26.38%   | 26.38%   | 26.38%   | 26.38%   |

Note: Numbers in italics indicate that the denominator of this rate is less than or equal to .30.

**Figure 35 - Payment Defaults Rates By Cohort Rating And Sector, 1994-2002**  
**(Including All Pari Passu/Collapsed Tranches In The Data Sample)**

| ALL         | Time Horizons (Years Since Cohorts Formed) |          |          |          |          |
|-------------|--|----------|----------|----------|----------|
|             | 1  | 2        | 3        | 4        | 5        |
| Aaa         | 0.02%                                      | 0.06%    | 0.11%    | 0.18%    | 0.21%    |
| Aa          | 0.13%                                      | 0.35%    | 0.68%    | 1.09%    | 1.32%    |
| A           | 0.28%                                      | 0.72%    | 1.04%    | 1.26%    | 1.53%    |
| Baa         | 1.20%                                      | 3.01%    | 5.78%    | 7.83%    | 9.88%    |
| Ba          | 4.28%                                      | 9.72%    | 13.22%   | 17.69%   | 19.12%   |
| B           | 7.03%                                      | 14.86%   | 22.21%   | 26.26%   | 27.85%   |
| Caa         | 21.82%                                     | 32.51%   | 43.40%   | 57.55%   | 57.55%   |
| <b>ABS</b>  | <b>1</b>                                   | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> |
| Aaa         | 0.00%                                      | 0.02%    | 0.07%    | 0.10%    | 0.10%    |
| Aa          | 0.32%                                      | 0.81%    | 1.55%    | 2.52%    | 2.96%    |
| A           | 0.26%                                      | 0.62%    | 0.87%    | 1.05%    | 1.26%    |
| Baa         | 1.30%                                      | 3.16%    | 7.06%    | 9.52%    | 13.97%   |
| Ba          | 9.13%                                      | 22.20%   | 28.72%   | 44.96%   | 49.32%   |
| B           | 15.11%                                     | 32.89%   | 46.56%   | 56.46%   | 56.46%   |
| Caa         | 40.82%                                     | 54.74%   | 54.74%   | 54.74%   | NA       |
| <b>CMBS</b> | <b>1</b>                                   | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> |
| Aaa         | 0.05%                                      | 0.14%    | 0.27%    | 0.53%    | 0.53%    |
| Aa          | 0.29%                                      | 0.74%    | 0.97%    | 1.38%    | 1.38%    |
| A           | 0.29%                                      | 0.60%    | 0.86%    | 1.34%    | 1.34%    |
| Baa         | 0.87%                                      | 1.97%    | 3.41%    | 5.69%    | 5.69%    |
| Ba          | 2.63%                                      | 6.35%    | 11.30%   | 15.33%   | 17.01%   |
| B           | 6.14%                                      | 14.77%   | 25.09%   | 32.23%   | 35.27%   |
| Caa         | 9.62%                                      | 23.52%   | 46.70%   | 82.23%   | NA       |
| <b>RMBS</b> | <b>1</b>                                   | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> |
| Aaa         | 0.02%                                      | 0.07%    | 0.12%    | 0.19%    | 0.23%    |
| Aa          | 0.03%                                      | 0.12%    | 0.37%    | 0.67%    | 0.88%    |
| A           | 0.35%                                      | 1.01%    | 1.47%    | 1.72%    | 2.07%    |
| Baa         | 1.29%                                      | 3.32%    | 5.67%    | 7.47%    | 8.74%    |
| Ba          | 2.65%                                      | 5.51%    | 7.68%    | 8.96%    | 9.99%    |
| B           | 5.91%                                      | 11.13%   | 16.04%   | 18.40%   | 19.86%   |
| Caa         | 26.87%                                     | 31.04%   | 31.04%   | 31.04%   | 31.04%   |

Note: Numbers in italics indicate that the denominator of this rate is less than or equal to 30.

## Appendix V: Comparing Material Impairment Rates Between Structured And Corporate Sectors

**Figure 36 - Cumulative Material Impairment Rates By Cohort And Original Rating, 1993-2002**

| <b>Corporate</b>  |                  |        |        |        |        |                    |        |        |        |        |
|-------------------|------------------|--------|--------|--------|--------|--------------------|--------|--------|--------|--------|
|                   | By Cohort Rating |        |        |        |        | By Original Rating |        |        |        |        |
|                   | Year 1           | Year 2 | Year 3 | Year 4 | Year 5 | Year 1             | Year 2 | Year 3 | Year 4 | Year 5 |
| Aaa               | 0.00%            | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%              | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| Aa                | 0.00%            | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%              | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| A                 | 0.00%            | 0.00%  | 0.00%  | 0.15%  | 0.15%  | 0.00%              | 0.00%  | 0.00%  | 0.21%  | 0.21%  |
| Baa               | 0.44%            | 0.95%  | 1.52%  | 2.21%  | 3.06%  | 0.58%              | 1.20%  | 1.86%  | 2.78%  | 3.87%  |
| Ba                | 0.77%            | 2.91%  | 6.40%  | 9.24%  | 11.96% | 4.10%              | 8.67%  | 13.38% | 16.97% | 20.82% |
| B                 | 6.06%            | 14.63% | 22.61% | 30.29% | 36.91% | 9.28%              | 19.02% | 27.46% | 34.59% | 40.57% |
| Caa               | 22.59%           | 37.82% | 50.85% | 62.56% | 72.92% | 14.51%             | 31.08% | 46.52% | 60.22% | 71.58% |
| Investment-Grade  | 0.20%            | 0.42%  | 0.67%  | 1.00%  | 1.33%  | 0.27%              | 0.55%  | 0.84%  | 1.31%  | 1.75%  |
| Speculative-Grade | 6.73%            | 14.23% | 21.37% | 27.76% | 33.29% | 8.27%              | 17.15% | 25.13% | 31.77% | 37.46% |
| All               | 4.09%            | 8.65%  | 12.97% | 16.76% | 19.88% | 5.26%              | 10.94% | 16.05% | 20.39% | 23.92% |
| <b>Structured</b> |                  |        |        |        |        |                    |        |        |        |        |
|                   | By Cohort Rating |        |        |        |        | By Original Rating |        |        |        |        |
|                   | Year 1           | Year 2 | Year 3 | Year 4 | Year 5 | Year 1             | Year 2 | Year 3 | Year 4 | Year 5 |
| Aaa               | 0.01%            | 0.08%  | 0.23%  | 0.42%  | 0.56%  | 0.00%              | 0.00%  | 0.03%  | 0.16%  | 0.24%  |
| Aa                | 0.24%            | 0.47%  | 0.80%  | 1.13%  | 1.23%  | 0.54%              | 0.81%  | 1.14%  | 1.51%  | 1.60%  |
| A                 | 0.27%            | 0.79%  | 1.20%  | 1.42%  | 1.48%  | 0.03%              | 0.34%  | 0.65%  | 0.83%  | 0.86%  |
| Baa               | 0.99%            | 2.53%  | 5.01%  | 6.49%  | 8.36%  | 0.26%              | 1.09%  | 2.27%  | 3.33%  | 3.87%  |
| Ba                | 3.95%            | 9.05%  | 12.37% | 16.48% | 17.95% | 0.43%              | 2.51%  | 5.16%  | 6.60%  | 7.16%  |
| B                 | 5.58%            | 11.78% | 16.87% | 19.18% | 20.35% | 0.90%              | 4.16%  | 9.10%  | 10.57% | 11.30% |
| Caa               | 23.58%           | 26.33% | 28.79% | 28.79% | 28.79% | 4.00%              | 4.00%  | 8.27%  | 8.27%  | 8.27%  |
| Investment-Grade  | 0.31%            | 0.80%  | 1.51%  | 2.00%  | 2.47%  | 0.17%              | 0.48%  | 0.90%  | 1.30%  | 1.48%  |
| Speculative-Grade | 5.05%            | 10.46% | 14.34% | 17.84% | 19.19% | 0.67%              | 3.15%  | 6.67%  | 8.10%  | 8.71%  |
| All               | 0.82%            | 1.85%  | 2.92%  | 3.75%  | 4.32%  | 0.22%              | 0.78%  | 1.55%  | 2.08%  | 2.33%  |

## Appendix VI: Lists Of U.S. ABS, CMBS And RMBS Payment Defaults And Ca Or C Rated Securities, 1993-2002

Figure 37 contains a list of 390 payment defaults, and Figure 38 contains a list of 168 Ca or C rated securities. Both are sorted by sector, collateral type, and deal name. The column "Is MI ?" indicates whether this security is in material impairment.

**Figure 37 - Payment Defaults (1993-2002)**

| Tranche Name | Deal Name                                  | Collateral Type | Original Rating | Payment Default Year | Ca or C Rating Year | Is MI ? |
|--------------|--|-----------------|-----------------|----------------------|---------------------|---------|
| <b>ABS</b>   |  |                 |                 |                      |                     |         |
| Class A      | AutoBond Master Funding Corporation 1997-B | AUTOS           | A3              | 2002                 | 1999                | YES     |
| Class A      | AutoBond Master Funding Corporation 1997-C | AUTOS           | A3              | 2002                 | 1999                | YES     |
| Class B      | LSI Auto Grantor Trust 1996-B              | AUTOS           | Ba2             | 1998                 | 1999                | YES     |
| Class B      | Captec Franchise Trust 1999-1              | FRANCHISE LOANS | Aa2             | 2002                 |                     | YES     |
| Class C      | Captec Franchise Trust 1999-1              | FRANCHISE LOANS | A2              | 2001                 |                     | YES     |
| Class D      | Captec Franchise Trust 1999-1              | FRANCHISE LOANS | Baa2            | 2001                 |                     | YES     |
| Class E      | Captec Franchise Trust 1999-1              | FRANCHISE LOANS | Ba2             | 2001                 |                     | YES     |
| Class F      | Captec Franchise Trust 1999-1              | FRANCHISE LOANS | B2              | 2001                 | 2002                | YES     |
| Class D      | Captec Grantor Trusts 2000-1               | FRANCHISE LOANS | Baa2            | 2002                 |                     | YES     |
| Class E      | Captec Grantor Trusts 2000-1               | FRANCHISE LOANS | Ba2             | 2001                 |                     | YES     |
| Class F      | Captec Grantor Trusts 2000-1               | FRANCHISE LOANS | B2              | 2000                 |                     | YES     |
| Class C      | CNL Funding 2000-A, L.P.                   | FRANCHISE LOANS | B2              | 2001                 |                     |         |
| Class D-2    | CNL Funding 98-1, LP                       | FRANCHISE LOANS | Baa1            | 2002                 |                     |         |
| Class E-2    | CNL Funding 98-1, LP                       | FRANCHISE LOANS | Baa3            | 2002                 |                     |         |
| Class A-2    | EMAC Owner Trust 1999-1                    | FRANCHISE LOANS | Aaa             | 2002                 |                     | YES     |
| Class B      | EMAC Owner Trust 1999-1                    | FRANCHISE LOANS | Aa3             | 2001                 | 2002                | YES     |
| Class C      | EMAC Owner Trust 1999-1                    | FRANCHISE LOANS | A1              | 2001                 | 2002                | YES     |
| Class D      | EMAC Owner Trust 1999-1                    | FRANCHISE LOANS | A3              | 2001                 | 2002                | YES     |
| Class E      | EMAC Owner Trust 1999-1                    | FRANCHISE LOANS | Baa2            | 2001                 | 2002                | YES     |
| Class F      | EMAC Owner Trust 1999-1                    | FRANCHISE LOANS | Ba1             | 2001                 | 2002                | YES     |
| Class G      | EMAC Owner Trust 1999-1                    | FRANCHISE LOANS | Ba3             | 2001                 | 2001                | YES     |
| Class B      | EMAC Owner Trust 2000-1                    | FRANCHISE LOANS | Aa2             | 2002                 |                     | YES     |
| Class C      | EMAC Owner Trust 2000-1                    | FRANCHISE LOANS | A2              | 2002                 | 2002                | YES     |
| Class D      | EMAC Owner Trust 2000-1                    | FRANCHISE LOANS | Baa2            | 2002                 | 2002                | YES     |
| Class E      | EMAC Owner Trust 2000-1                    | FRANCHISE LOANS | Ba2             | 2002                 | 2002                | YES     |
| Class F      | EMAC Owner Trust 2000-1                    | FRANCHISE LOANS | B2              | 2002                 | 2002                | YES     |
| Class D      | FMAC Loan Receivables Trust 1998-C         | FRANCHISE LOANS | Baa2            | 2002                 |                     | YES     |
| Class B      | Franchise Loan Trust 1998-I                | FRANCHISE LOANS | Aa2             | 2002                 |                     |         |
| Class C      | Franchise Loan Trust 1998-I                | FRANCHISE LOANS | A2              | 2001                 |                     | YES     |
| Class D      | Franchise Loan Trust 1998-I                | FRANCHISE LOANS | Baa2            | 2001                 | 2002                | YES     |
| Class E      | Franchise Loan Trust 1998-I                | FRANCHISE LOANS | Ba2             | 2001                 | 2001                | YES     |
| Class F      | Franchise Loan Trust 1998-I                | FRANCHISE LOANS | B2              | 2000                 | 2001                | YES     |
| Class B      | Global Franchise Trust 1998-1              | FRANCHISE LOANS | Aa2             | 2002                 |                     |         |
| Class C      | Global Franchise Trust 1998-1              | FRANCHISE LOANS | A2              | 2002                 | 2002                |         |
| Class D      | Global Franchise Trust 1998-1              | FRANCHISE LOANS | Baa3            | 2002                 | 2002                | YES     |
| Class C      | Peachtree Franchise Loan LLC 1999-A        | FRANCHISE LOANS | A2              | 2001                 |                     | YES     |
| Class D      | Peachtree Franchise Loan LLC 1999-A        | FRANCHISE LOANS | Baa2            | 2001                 |                     | YES     |

**Figure 37 - Payment Defaults (1993-2002) (Continued)**

| Tranche Name | Deal Name  | Collateral Type | Original Rating | Payment Default Year | Ca or C Rating Year | Is MI ? |
|--------------|--|-----------------|-----------------|----------------------|---------------------|---------|
| Class E      | Peachtree Franchise Loan LLC 1999-A                        | FRANCHISE LOANS | Ba2             | 2001                 | 2002                | YES     |
| Class F      | Peachtree Franchise Loan LLC 1999-A                        | FRANCHISE LOANS | B2              | 2001                 | 2002                | YES     |
| M-2          | ContiMortgage Home Equity Loan Trust 1997-01               | HEL             | A3              | 2000                 |                     | YES     |
| B            | ContiMortgage Home Equity Loan Trust 1997-01               | HEL             | Baa3            | 1999                 | 1999                | YES     |
| B-1A         | ContiMortgage Home Equity Loan Trust 1997-2                | HEL             | Baa3            | 2000                 |                     | YES     |
| M-2F         | ContiMortgage Home Equity Loan Trust 1997-2                | HEL             | A3              | 2001                 |                     | YES     |
| B            | ContiMortgage Home Equity Loan Trust 1997-4                | HEL             | Baa3            | 2000                 |                     | YES     |
| B3           | GE Capital Mtg Services Inc 1996-HE3                       | HEL             | Ba2             | 2000                 | 2001                | YES     |
| B4           | GE Capital Mtg Services Inc 1996-HE3                       | HEL             | B3              | 2000                 | 1999                | YES     |
| B2           | GE Capital Mtg Services Inc 1997-HE2                       | HEL             | Baa2            | 2002                 |                     | YES     |
| B3           | GE Capital Mtg Services Inc 1997-HE2                       | HEL             | Ba2             | 2000                 | 2001                | YES     |
| B4           | GE Capital Mtg Services Inc 1997-HE2                       | HEL             | B2              | 2000                 | 2001                | YES     |
| B3           | GE Capital Mtg Services Inc 1997-HE3                       | HEL             | Ba2             | 2002                 |                     | YES     |
| B4           | GE Capital Mtg Services Inc 1997-HE3                       | HEL             | B2              | 2001                 | 2001                | YES     |
| B3           | GE Capital Mtg Services Inc 1997-HE4                       | HEL             | Ba2             | 2002                 |                     | YES     |
| B4           | GE Capital Mtg Services Inc 1997-HE4                       | HEL             | B2              | 2001                 | 2001                | YES     |
| B3           | GE Capital Mtg Services Inc 1998-HE1                       | HEL             | Ba2             | 2002                 |                     | YES     |
| B4           | GE Capital Mtg Services Inc 1998-HE1                       | HEL             | B2              | 2001                 | 2001                | YES     |
| B4           | GE Capital Mtg Services Inc 1998-HE2                       | HEL             | B2              | 2001                 | 2001                | YES     |
| B-2          | Green Tree Home Improvement Loans 1994-CI                  | HEL             | Baa1            | 1998                 |                     | YES     |
| Certificate  | Green Tree Home Improvement Loans 1995-B                   | HEL             | A3              | 1996                 |                     | YES     |
| A            | Green Tree Home Improvement Loans 1996-B                   | HEL             | A3              | 1999                 |                     | YES     |
| B            | IMC Home Equity Loan Trust 1997-3                          | HEL             | Baa3            | 2001                 |                     | YES     |
| B            | IMC Home Equity Loan Trust 1997-5                          | HEL             | Baa3            | 2001                 |                     | YES     |
| B-2          | Impac CMN Trust 1998-1                                     | HEL             | Ba2             | 2000                 | 2001                | YES     |
| B-5          | Ocwen Residential MBS Corp. Mortgage Pass-Through, 1998-R3 | HEL             | B2              | 2000                 |                     | YES     |
| B-3          | Ocwen Residential MBS Corp. Mortgage Pass-Through, 1998-R3 | HEL             | Baa2            | 2002                 |                     | YES     |
| B-4          | Ocwen Residential MBS Corp. Mortgage Pass-Through, 1998-R3 | HEL             | Ba2             | 2001                 |                     | YES     |
| B1-I         | Residential Asset Securities Corp 1995-KS3                 | HEL             | Ba2             | 1997                 |                     | YES     |
| B2-I         | Residential Asset Securities Corp 1995-KS3                 | HEL             | B2              | 1996                 |                     | YES     |
| B1-II        | Residential Asset Securities Corp 1995-KS3                 | HEL             | Ba2             | 1997                 |                     | YES     |
| CI. BF-3     | Saxon Asset Securities Trust 1998-2                        | HEL             | B2              | 2000                 |                     |         |
| CI. BV-3     | Saxon Asset Securities Trust 1998-2                        | HEL             | B2              | 2001                 |                     |         |
| BF-3         | Saxon Asset Securities Trust 1998-3                        | HEL             | B2              | 2001                 |                     |         |
| BV-3         | Saxon Asset Securities Trust 1998-3                        | HEL             | B2              | 2001                 |                     |         |
| BF-3         | Saxon Asset Securities Trust 1999-1                        | HEL             | B2              | 2001                 |                     | YES     |
| BV-3         | Saxon Asset Securities Trust 1999-1                        | HEL             | B2              | 2000                 |                     |         |
| B            | Security National Mortgage Loan Trust 1998-1               | HEL             | A3              | 2001                 |                     | YES     |
| CI. D        | Centerpoint Funding Company II, L.L.C. Series 2001-1       | LEASES          | Caa1            | 2002                 | 2002                | YES     |
| Class D      | Centerpoint Funding Company II, LLC                        | LEASES          | B3              | 2002                 | 2002                | YES     |
| A-7          | BankAmerica MH Contract 1996-1                             | MH              | Aa3             | 1998                 |                     |         |
| B-1          | BankAmerica MH Contract 1996-1                             | MH              | Baa2            | 1998                 |                     | YES     |
| B-2          | BankAmerica MH Contract 1996-1                             | MH              | Ba2             | 1998                 | 1999                | YES     |
| M            | BankAmerica MH Contract 1997-1                             | MH              | Aa3             | 1999                 |                     | YES     |
| B-1          | BankAmerica MH Contract 1997-1                             | MH              | Baa2            | 1999                 |                     | YES     |

**Figure 37 - Payment Defaults (1993-2002) (Continued)**

| Tranche Name | Deal Name  | Collateral Type | Original Rating | Payment Default Year | Ca or C Rating Year | Is MI ? |
|--------------|--|-----------------|-----------------|----------------------|---------------------|---------|
| B-2          | BankAmerica MH Contract 1997-1                               | MH              | Ba2             | 1999                 |                     | YES     |
| M            | BankAmerica MH Contract 1997-2                               | MH              | Aa3             | 1999                 |                     | YES     |
| B-1          | BankAmerica MH Contract 1997-2                               | MH              | Baa2            | 1999                 |                     | YES     |
| B-2          | BankAmerica MH Contract 1997-2                               | MH              | Ba2             | 1999                 | 2000                | YES     |
| B-2          | BankAmerica MH Contract 1998-1                               | MH              | Ba2             | 2002                 |                     | YES     |
| M            | BankAmerica MH Contract 1998-2                               | MH              | Aa3             | 2001                 |                     | YES     |
| B-1          | BankAmerica MH Contract 1998-2                               | MH              | Baa2            | 2001                 |                     | YES     |
| B-2          | BankAmerica MH Contract 1998-2                               | MH              | Ba2             | 2001                 |                     | YES     |
| B-2          | Bombardier Capital Mortgage Securitization Corp 1998-B       | MH              | Ba2             | 2002                 | 2002                | YES     |
| B-2          | Bombardier Capital Mortgage Securitization Corp 1999-B       | MH              | Ba2             | 2002                 | 2002                | YES     |
| Cl. B-2      | Bombardier Capital Mortgage Securitization Corp 2000-A       | MH              | Ba2             | 2002                 | 2002                | YES     |
| Cl. B-2      | Conseco Finance Securitizations Corp. Series 1999-6          | MH              | Ba1             | 2002                 |                     | YES     |
| Cl. B-2      | Conseco Finance Securitizations Corp. Series 2000-1          | MH              | Baa3            | 2002                 | 2002                | YES     |
| Cl. B-2      | Conseco Finance Securitizations Corp. Series 2000-5          | MH              | Ba2             | 2002                 |                     | YES     |
| Cl. B-2      | Conseco Finance Securitizations Corp. Series 2000-6          | MH              | Ba2             | 2002                 |                     | YES     |
| Cl. B-2      | Conseco Finance Securitizations Corp. Series 2001-1          | MH              | Ba1             | 2002                 |                     | YES     |
| Class B-2    | Deutsche Financial Capital Securitization LLC, Series 1997-1 | MH              | Ba2             | 2002                 |                     | YES     |
| B            | FirstFed Corp. MH 1996-1                                     | MH              | Baa2            | 1999                 |                     | YES     |
| Class B      | FirstFed Corp. MH 1997-1                                     | MH              | Baa2            | 1999                 |                     | YES     |
| Class B      | FirstFed Corp. MH 1997-2                                     | MH              | Baa2            | 2001                 |                     | YES     |
| B            | Green Tree Financial Corporation MH 1993-02                  | MH              | Baa3            | 2002                 |                     | YES     |
| B-2          | Green Tree Financial Corporation MH 1994-07                  | MH              | Baa1            | 2002                 | 2002                | YES     |
| B-2          | Green Tree Financial Corporation MH 1994-08                  | MH              | Baa1            | 1998                 |                     |         |
| B-2          | Green Tree Financial Corporation MH 1995-02                  | MH              | Baa1            | 1998                 |                     |         |
| B-2          | Green Tree Financial Corporation MH 1995-03                  | MH              | Baa1            | 1998                 |                     |         |
| B-2          | Green Tree Financial Corporation MH 1995-06                  | MH              | Baa1            | 1998                 | 2002                | YES     |
| B-2          | Green Tree Financial Corporation MH 1995-07                  | MH              | Baa1            | 1998                 | 2002                |         |
| B-2          | Green Tree Financial Corporation MH 1995-08                  | MH              | Baa1            | 2002                 | 2002                | YES     |
| B-2          | Green Tree Financial Corporation MH 1995-09                  | MH              | Baa1            | 2002                 | 2002                | YES     |
| B-2          | Green Tree Financial Corporation MH 1995-10                  | MH              | Baa1            | 2002                 | 2002                | YES     |
| B-2          | Green Tree Financial Corporation MH 1996-01                  | MH              | Baa1            | 2002                 | 2002                | YES     |
| B-2          | Green Tree Financial Corporation MH 1996-02                  | MH              | Baa1            | 2002                 | 2002                | YES     |
| B-1          | Green Tree Financial Corporation MH 1996-03                  | MH              | Baa1            | 1998                 |                     |         |
| B-2          | Green Tree Financial Corporation MH 1996-03                  | MH              | Baa1            | 2002                 | 2002                | YES     |
| B-2          | Green Tree Financial Corporation MH 1996-04                  | MH              | Baa1            | 2002                 | 2002                | YES     |
| B-2          | Green Tree Financial Corporation MH 1996-05                  | MH              | Baa1            | 2002                 | 2002                | YES     |
| B-2          | Green Tree Financial Corporation MH 1996-06                  | MH              | Baa1            | 2002                 | 2002                | YES     |
| B-2          | Green Tree Financial Corporation MH 1996-07                  | MH              | Baa1            | 2002                 | 2002                | YES     |
| B-2          | Green Tree Financial Corporation MH 1996-08                  | MH              | Baa1            | 2002                 | 2002                | YES     |
| B-2          | Green Tree Financial Corporation MH 1996-09                  | MH              | Baa1            | 2002                 | 2002                | YES     |
| B-2          | Green Tree Financial Corporation MH 1997-02                  | MH              | Baa1            | 2002                 | 2002                | YES     |
| B-2          | Green Tree Financial Corporation MH 1997-03                  | MH              | Baa1            | 2002                 | 2002                | YES     |
| B-2          | Green Tree Financial Corporation MH 1997-04                  | MH              | Baa1            | 2002                 | 2002                | YES     |
| B-2          | Green Tree Financial Corporation MH 1997-05                  | MH              | Baa1            | 2002                 | 2002                | YES     |
| B-2          | Green Tree Financial Corporation MH 1998-01                  | MH              | Baa3            | 2002                 | 2002                | YES     |

**Figure 37 - Payment Defaults (1993-2002) (Continued)**

| Tranche Name | Deal Name   | Collateral Type | Original Rating | Payment Default Year | Ca or C Rating Year | Is MI ? |
|--------------|---|-----------------|-----------------|----------------------|---------------------|---------|
| B-2          | Green Tree Financial Corporation MH 1998-02   | MH              | Baa3            | 2002                 |                     | YES     |
| B-2          | Green Tree Financial Corporation MH 1998-04   | MH              | Baa3            | 2002                 |                     | YES     |
| B-2          | Green Tree Financial Corporation MH 1998-05   | MH              | Baa3            | 2002                 |                     | YES     |
| B-2          | Green Tree Financial Corporation MH 1998-07   | MH              | Baa3            | 2002                 |                     | YES     |
| B-2          | Green Tree Financial Corporation MH 1998-08   | MH              | Ba1             | 2002                 | 2002                | YES     |
| A-4          | Greenwich Capital Acpt MH 1995-BA1  | MH              | Aa3             | 2001                 |                     |         |
| B-1          | Greenwich Capital Acpt MH 1995-BA1  | MH              | Baa2            | 2001                 |                     | YES     |
| B-2          | Greenwich Capital Acpt MH 1995-BA1  | MH              | Ba2             | 2001                 |                     | YES     |
| B-1          | IndyMac MH Contract 1997-1  | MH              | Baa2            | 2002                 |                     | YES     |
| B-2          | IndyMac MH Contract 1997-1  | MH              | Ba2             | 2001                 |                     | YES     |
| B-1          | IndyMac MH Contract 1998-1  | MH              | Baa2            | 2002                 |                     | YES     |
| B-2          | IndyMac MH Contract 1998-1  | MH              | Ba2             | 2001                 |                     | YES     |
| B-2          | Oakwood Mortgage Investors, Inc., Series 1997-D   | MH              | Baa3            | 2000                 |                     | YES     |
| B-1          | Oakwood Mortgage Investors, Inc., Series 1998-C   | MH              | Baa2            | 2002                 |                     |         |
| B-2          | Oakwood Mortgage Investors, Inc., Series 1998-C   | MH              | Ba2             | 2002                 |                     | YES     |
| M-2          | Oakwood Mortgage Investors, Inc., Series 1998-C   | MH              | A2              | 2002                 |                     |         |
| B-2          | Oakwood Mortgage Investors, Inc., Series 1998-D   | MH              | Baa3            | 2000                 |                     | YES     |
| B-2          | Oakwood Mortgage Investors, Inc., Series 1999-A   | MH              | Baa3            | 2000                 |                     | YES     |
| B-2          | Oakwood Mortgage Investors, Inc., Series 1999-B   | MH              | Baa3            | 2000                 |                     | YES     |
| Cl. B-1      | Oakwood Mortgage Investors, Inc., Series 1999-C   | MH              | Baa3            | 2002                 |                     |         |
| Cl. B-2      | Oakwood Mortgage Investors, Inc., Series 1999-C   | MH              | B3              | 2000                 |                     | YES     |
| Cl. B-2      | OMI Trust 2000-C  | MH              | Ba3             | 2002                 |                     | YES     |
| Class B      | Signal Securitization Corp. MH 1997-3   | MH              | Baa2            | 2001                 |                     | YES     |
| M            | UCFC Funding Corporation 1996-1   | MH              | Aa3             | 2001                 |                     | YES     |
| B-1          | UCFC Funding Corporation 1996-1   | MH              | Baa2            | 2001                 |                     | YES     |
| B-2          | UCFC Funding Corporation 1996-1   | MH              | Ba2             | 2000                 | 2000                | YES     |
| M            | UCFC Funding Corporation 1997-1   | MH              | Aa3             | 2001                 |                     | YES     |
| B-1          | UCFC Funding Corporation 1997-1   | MH              | Baa2            | 2001                 |                     | YES     |
| B-2          | UCFC Funding Corporation 1997-1   | MH              | Ba1             | 2000                 | 2000                | YES     |
| M            | UCFC Funding Corporation 1997-2   | MH              | Aa3             | 2001                 |                     | YES     |
| B-1          | UCFC Funding Corporation 1997-2   | MH              | Baa2            | 2001                 |                     | YES     |
| B-2          | UCFC Funding Corporation 1997-2   | MH              | Ba1             | 2001                 | 2000                | YES     |
| A-4          | UCFC Funding Corporation 1997-3   | MH              | Aaa             | 2001                 |                     |         |
| M            | UCFC Funding Corporation 1997-3   | MH              | Aa3             | 2001                 |                     | YES     |
| B-1          | UCFC Funding Corporation 1997-3   | MH              | Baa2            | 2001                 |                     | YES     |
| B-2          | UCFC Funding Corporation 1997-3   | MH              | Ba1             | 2001                 | 2000                | YES     |
| M            | UCFC Funding Corporation 1997-4   | MH              | Aa3             | 2001                 |                     | YES     |
| B-1          | UCFC Funding Corporation 1997-4   | MH              | Baa2            | 2001                 |                     | YES     |
| M            | UCFC Funding Corporation 1998-1   | MH              | Aa3             | 1999                 |                     | YES     |
| B-1          | UCFC Funding Corporation 1998-1   | MH              | Baa2            | 1999                 |                     | YES     |
| <b>CMBS</b>  |   |                 |                 |                      |                     |         |
| Cl. E        | 1211 Avenue of the Americas Trust Commercial Mortgage Pass-Through Certificates, Series 2000-1211 | CMBS            | Baa3            | 2002                 |                     | YES     |
| Cl. H        | COMM 2001-J2 Commercial Mortgage Pass-Through Certificates  | CMBS            | Ba1             | 2002                 |                     | YES     |
| G            | Commercial Mortgage Acceptance Corp 1997-ML1  | CMBS            | B2              | 2000                 |                     | YES     |

**Figure 37 - Payment Defaults (1993-2002) (Continued)**

| Tranche Name | Deal Name  | Collateral Type | Original Rating | Payment Default Year | Ca or C Rating Year | Is MI ? |
|--------------|--|-----------------|-----------------|----------------------|---------------------|---------|
| M            | Commercial Mortgage Acceptance Corp 1998-C1  | CMBS            | Caa2            | 2001                 |                     |         |
| J            | Commercial Mortgage Asset Trust 1999-C1  | CMBS            | B1              | 2002                 |                     |         |
| K            | Commercial Mortgage Asset Trust 1999-C1  | CMBS            | B2              | 2002                 |                     | YES     |
| L            | Commercial Mortgage Asset Trust 1999-C1  | CMBS            | B3              | 2002                 |                     | YES     |
| J            | CS First Boston Mortgage Securities Corp 1997-C1                                       | CMBS            | Caa2            | 2001                 |                     |         |
| G            | CS First Boston Mortgage Securities Corp 1998-FL1                                      | CMBS            | Ba2             | 2002                 |                     |         |
| H            | CS First Boston Mortgage Securities Corp 1998-FL1                                      | CMBS            | B2              | 2002                 |                     |         |
| D            | CS First Boston Mortgage Securities Corp 1998-FL2                                      | CMBS            | Baa2            | 2002                 |                     |         |
| E            | CS First Boston Mortgage Securities Corp 1998-FL2                                      | CMBS            | Baa3            | 2002                 |                     |         |
| B-5          | DLJ Commercial Mortgage Corp 1998-STF1   | CMBS            | B2              | 2002                 |                     |         |
| B-6          | DLJ Commercial Mortgage Corp 1998-STF1   | CMBS            | B3              | 2001                 |                     |         |
| A-1          | DLJ Commercial Mortgage Corp 1998-STF2   | CMBS            | Aaa             | 2002                 |                     |         |
| A-2          | DLJ Commercial Mortgage Corp 1998-STF2   | CMBS            | Aa2             | 2002                 |                     |         |
| A-3          | DLJ Commercial Mortgage Corp 1998-STF2   | CMBS            | A2              | 2002                 |                     | YES     |
| B-1          | DLJ Commercial Mortgage Corp 1998-STF2   | CMBS            | Baa2            | 2002                 |                     | YES     |
| B-2          | DLJ Commercial Mortgage Corp 1998-STF2   | CMBS            | Baa3            | 2002                 |                     | YES     |
| B-3          | DLJ Commercial Mortgage Corp 1998-STF2   | CMBS            | Ba2             | 2002                 |                     | YES     |
| B-4          | DLJ Commercial Mortgage Corp 1998-STF2   | CMBS            | Ba3             | 2001                 |                     | YES     |
| B-5          | DLJ Commercial Mortgage Corp 1998-STF2   | CMBS            | B2              | 2001                 |                     | YES     |
| B-6          | DLJ Commercial Mortgage Corp 1998-STF2   | CMBS            | B3              | 2001                 |                     | YES     |
| B-3          | DLJ Commercial Mortgage Trust 1999-STF1  | CMBS            | Ba2             | 2002                 |                     |         |
| B-4          | DLJ Commercial Mortgage Trust 1999-STF1  | CMBS            | Ba3             | 2002                 |                     |         |
| B-5          | DLJ Commercial Mortgage Trust 1999-STF1  | CMBS            | B2              | 2002                 |                     |         |
| B-6          | DLJ Commercial Mortgage Trust 1999-STF1  | CMBS            | B3              | 2002                 |                     |         |
| Cl. B-8      | DLJ Commercial Mortgage Trust 2000-CKP1  | CMBS            | B2              | 2002                 |                     | YES     |
| Cl. B-9      | DLJ Commercial Mortgage Trust 2000-CKP1  | CMBS            | B3              | 2002                 |                     | YES     |
| Cl. B-4      | DLJ Commercial Mortgage Trust 2000-STF1  | CMBS            | Ba2             | 2002                 |                     |         |
| Cl. B-5      | DLJ Commercial Mortgage Trust 2000-STF1  | CMBS            | Ba3             | 2002                 |                     |         |
| Cl. B-6      | DLJ Commercial Mortgage Trust 2000-STF1  | CMBS            | B2              | 2002                 |                     |         |
| Cl. B-7      | DLJ Commercial Mortgage Trust 2000-STF1  | CMBS            | B3              | 2002                 |                     |         |
| K            | First Union-Lehman Brothers-Bank of America 1998-C2                                    | CMBS            | B2              | 2002                 |                     |         |
| L            | First Union-Lehman Brothers-Bank of America 1998-C2                                    | CMBS            | B3              | 2002                 |                     |         |
| M            | First Union-Lehman Brothers-Bank of America 1998-C2                                    | CMBS            | Caa2            | 2002                 |                     |         |
| Cl. B        | Four Times Square Trust Commercial Mortgage Pass-Through Certificates, Series 2000-4TS | CMBS            | Aa2             | 2002                 |                     |         |
| Cl. C        | Four Times Square Trust Commercial Mortgage Pass-Through Certificates, Series 2000-4TS | CMBS            | A2              | 2002                 |                     |         |
| Cl. D        | Four Times Square Trust Commercial Mortgage Pass-Through Certificates, Series 2000-4TS | CMBS            | Baa2            | 2002                 |                     | YES     |
| H            | GMAC Commercial Mortgage Securities Inc 1997-C2  | CMBS            | B2              | 2002                 |                     | YES     |
| J            | GMAC Commercial Mortgage Securities Inc 1997-C2  | CMBS            | B3              | 2002                 |                     | YES     |
| G            | GS Mortgage Securities Corporation II 1999-C1  | CMBS            | B2              | 2000                 |                     | YES     |
| H            | GS Mortgage Securities Corporation II 1999-C1  | CMBS            | B3              | 2000                 |                     |         |
| J            | J. P. Morgan Commercial Mortgage Finance Corp. 2000-C9                                 | CMBS            | B2              | 2002                 |                     |         |
| K            | J. P. Morgan Commercial Mortgage Finance Corp. 2000-C9                                 | CMBS            | B3              | 2002                 |                     | YES     |
| K            | J.P. Morgan Commercial Mortgage Finance Corp 1999-C8                                   | CMBS            | B3              | 2002                 |                     | YES     |
| J            | J.P. Morgan Commercial Mortgage Finance Corp 1999-C8                                   | CMBS            | B2              | 2002                 |                     |         |
| L            | LB Commercial Mortgage Trust 1999-C1   | CMBS            | Caa2            | 2002                 |                     |         |



Figure 37 - Payment Defaults (1993-2002) (Continued)

| Tranche Name | Deal Name   | Collateral Type | Original Rating | Payment Default Year | Ca or C Rating Year | Is MI ? |
|--------------|---|-----------------|-----------------|----------------------|---------------------|---------|
| D            | Morgan Stanley Capital I 1997-C1  | CMBS            | Baa2            | 2001                 |                     |         |
| E            | Morgan Stanley Capital I 1997-C1  | CMBS            | Baa3            | 2001                 |                     |         |
| F            | Morgan Stanley Capital I 1997-C1  | CMBS            | Ba2             | 2001                 |                     |         |
| G            | Morgan Stanley Capital I 1997-C1  | CMBS            | Ba3             | 2001                 |                     |         |
| H            | Morgan Stanley Capital I 1997-C1  | CMBS            | B3              | 2001                 |                     |         |
| D            | Morgan Stanley Capital I Inc. 1998-CF1  | CMBS            | Baa2            | 2002                 |                     |         |
| E            | Morgan Stanley Capital I Inc. 1998-CF1  | CMBS            | Baa3            | 2001                 |                     | YES     |
| F            | Morgan Stanley Capital I Inc. 1998-CF1  | CMBS            | Ba1             | 2001                 |                     | YES     |
| G            | Morgan Stanley Capital I Inc. 1998-CF1  | CMBS            | Ba2             | 2001                 |                     | YES     |
| H            | Morgan Stanley Capital I Inc. 1998-CF1  | CMBS            | Ba3             | 2001                 |                     | YES     |
| J            | Morgan Stanley Capital I Inc. 1998-CF1  | CMBS            | B1              | 2001                 | 2002                | YES     |
| K            | Morgan Stanley Capital I Inc. 1998-CF1  | CMBS            | B2              | 2001                 | 2002                | YES     |
| L            | Morgan Stanley Capital I Inc. 1998-CF1  | CMBS            | B3              | 2001                 | 2002                | YES     |
| M            | Morgan Stanley Capital I Inc. 1998-CF1  | CMBS            | Caa2            | 2001                 | 2001                | YES     |
| F            | Mortgage Capital Funding Inc 1996-MC2   | CMBS            | Ba2             | 2002                 |                     |         |
| G            | Mortgage Capital Funding Inc 1996-MC2   | CMBS            | B2              | 2000                 |                     | YES     |
| K            | Mortgage Capital Funding Inc 1998-MC3   | CMBS            | B3              | 2002                 |                     |         |
| F            | Paine Webber Mortgage Acceptance Corporation V 1999-C1  | CMBS            | Ba2             | 2002                 |                     |         |
| G            | Paine Webber Mortgage Acceptance Corporation V 1999-C1  | CMBS            | B2              | 2002                 |                     |         |
| H            | Paine Webber Mortgage Acceptance Corporation V 1999-C1  | CMBS            | B3              | 2002                 |                     | YES     |
| CI. J        | PNC Mortgage Acceptance Corp. Commercial Mortgage Pass-Through Certificates, Series 2000-C1   | CMBS            | Ba3             | 2002                 |                     |         |
| CI. K        | PNC Mortgage Acceptance Corp. Commercial Mortgage Pass-Through Certificates, Series 2000-C1   | CMBS            | B1              | 2002                 |                     |         |
| CI. L        | PNC Mortgage Acceptance Corp. Commercial Mortgage Pass-Through Certificates, Series 2000-C1   | CMBS            | B2              | 2002                 |                     |         |
| CI. M        | PNC Mortgage Acceptance Corp. Commercial Mortgage Pass-Through Certificates, Series 2000-C1   | CMBS            | B3              | 2002                 |                     |         |
| CI. N        | ROCK 2001-C1 Commercial Mortgage Pass-Through Certificates, Series 2001-C1  | CMBS            | B3              | 2002                 |                     |         |
| CI. G-GF     | Salomon Brothers Mortgage Securities VII, Inc., CDC Securitization Corporation Commercial Mortgage Pass-Through Certificates, Series 2001-CDC | CMBS            | B1              | 2002                 |                     |         |
| CI. H-DS     | Salomon Brothers Mortgage Securities VII, Inc., CDC Securitization Corporation Commercial Mortgage Pass-Through Certificates, Series 2001-CDC | CMBS            | Baa3            | 2002                 |                     |         |
| B            | Structured Asset Securities Corporation 1997-LL1  | CMBS            | Aa2             | 1999                 |                     |         |
| C-1          | Structured Asset Securities Corporation 1997-LL1  | CMBS            | A2              | 1998                 |                     |         |
| D            | Structured Asset Securities Corporation 1997-LL1  | CMBS            | Baa2            | 1998                 |                     |         |
| E            | Structured Asset Securities Corporation 1997-LL1  | CMBS            | Baa3            | 1998                 |                     |         |
| F            | Structured Asset Securities Corporation 1997-LL1  | CMBS            | Ba2             | 1998                 |                     |         |
| <b>RMBS</b>  |   |                 |                 |                      |                     |         |
| 4A           | American Mtg Trust 1993-04  | RMBS            | Ba2             | 1996                 | 1996                | YES     |
| B-3          | C-BASS ABS, LLC Trust Certificates, Series 1998-2   | RMBS            | B2              | 2002                 |                     | YES     |
| B-1          | Citicorp Mtg Sec Inc 1993-08  | RMBS            | Baa3            | 1996                 |                     | YES     |
| B-1          | Citicorp Mtg Sec Inc 1993-10  | RMBS            | Baa3            | 2002                 |                     | YES     |
| B-2          | CWMBS Inc 1994-L  | RMBS            | Baa3            | 2001                 |                     |         |
| B-3          | CWMBS Inc 1994-L  | RMBS            | B1              | 2001                 |                     |         |
| B-2          | CWMBS Inc 1995-04   | RMBS            | Baa2            | 2000                 |                     |         |
| B-2          | CWMBS Inc 1997-07   | RMBS            | Baa2            | 2001                 |                     |         |
| B-1          | DLJ Mtg Acpt Corp 1993-Q03  | RMBS            | Baa2            | 1997                 | 1998                | YES     |
| B-1          | DLJ Mtg Acpt Corp 1993-Q06  | RMBS            | Baa2            | 1998                 | 1998                | YES     |

**Figure 37 - Payment Defaults (1993-2002) (Continued)**

| Tranche Name | Deal Name                   | Collateral Type | Original Rating | Payment Default Year | Ca or C Rating Year | Is MI ? |
|--------------|-----------------------------|-----------------|-----------------|----------------------|---------------------|---------|
| B-1          | DLJ Mtg Acpt Corp 1993-Q13  | RMBS            | Baa3            | 1998                 | 1998                | YES     |
| B-1          | DLJ Mtg Acpt Corp 1993-Q16  | RMBS            | Baa3            | 1998                 | 1998                | YES     |
| B-1          | DLJ Mtg Acpt Corp 1993-QE01 | RMBS            | Baa2            | 1996                 | 1996                | YES     |
| B-1          | DLJ Mtg Acpt Corp 1993-QE05 | RMBS            | Baa2            | 1996                 | 1996                | YES     |
| B-1          | DLJ Mtg Acpt Corp 1993-QE11 | RMBS            | Baa2            | 1996                 | 1996                | YES     |
| B-1          | DLJ Mtg Acpt Corp 1994-Q07  | RMBS            | Baa3            | 1998                 |                     |         |
| Cl. B-1      | DLJ Mtg Acpt Corp 1994-Q12  | RMBS            | Baa3            | 2000                 |                     | YES     |
| I B-1        | DLJ Mtg Acpt Corp 1994-Q13  | RMBS            | Baa3            | 1999                 |                     |         |
| I B-2        | DLJ Mtg Acpt Corp 1994-Q13  | RMBS            | B3              | 1997                 | 1998                | YES     |
| II B-1       | DLJ Mtg Acpt Corp 1994-Q13  | RMBS            | Baa3            | 1999                 | 1999                | YES     |
| II B-2       | DLJ Mtg Acpt Corp 1994-Q13  | RMBS            | B3              | 1997                 | 1998                | YES     |
| III B-1      | DLJ Mtg Acpt Corp 1994-Q13  | RMBS            | Baa3            | 1997                 | 1998                | YES     |
| III B-2      | DLJ Mtg Acpt Corp 1994-Q13  | RMBS            | B3              | 1997                 |                     | YES     |
| B-1          | DLJ Mtg Acpt Corp 1994-Q14  | RMBS            | Baa3            | 1998                 |                     | YES     |
| I B-1        | DLJ Mtg Acpt Corp 1994-Q16  | RMBS            | Baa3            | 1998                 | 1998                | YES     |
| II B-1       | DLJ Mtg Acpt Corp 1994-Q16  | RMBS            | Baa3            | 1997                 | 1998                | YES     |
| B-1          | DLJ Mtg Acpt Corp 1994-QE01 | RMBS            | Baa2            | 1997                 | 1998                | YES     |
| B-2          | DLJ Mtg Acpt Corp 1994-QE01 | RMBS            | B2              | 1997                 | 1996                | YES     |
| B-1          | DLJ Mtg Acpt Corp 1994-QE02 | RMBS            | Baa2            | 1997                 | 1998                | YES     |
| B-1          | DLJ Mtg Acpt Corp 1994-QE04 | RMBS            | Baa2            | 1997                 | 1998                | YES     |
| B-2          | DLJ Mtg Acpt Corp 1994-QE04 | RMBS            | B1              | 1997                 |                     | YES     |
| A-1          | DLJ Mtg Acpt Corp 1994-QE05 | RMBS            | Aaa             | 2000                 |                     | YES     |
| A-2          | DLJ Mtg Acpt Corp 1994-QE05 | RMBS            | Aa1             | 1999                 | 1999                | YES     |
| B-1          | DLJ Mtg Acpt Corp 1994-QE05 | RMBS            | Baa2            | 1997                 | 1998                | YES     |
| B-2          | DLJ Mtg Acpt Corp 1994-QE05 | RMBS            | B1              | 1996                 | 1996                | YES     |
| A-1          | DLJ Mtg Acpt Corp 1994-QE07 | RMBS            | Aaa             | 1999                 | 1999                | YES     |
| A-2          | DLJ Mtg Acpt Corp 1994-QE07 | RMBS            | Aa1             | 1998                 |                     | YES     |
| B-1          | DLJ Mtg Acpt Corp 1994-QE07 | RMBS            | Baa1            | 1997                 | 1998                | YES     |
| B-2          | DLJ Mtg Acpt Corp 1994-QE07 | RMBS            | Ba3             | 1996                 | 1996                | YES     |
| B-1          | DLJ Mtg Acpt Corp 1995-Q01  | RMBS            | Baa2            | 1998                 | 1998                | YES     |
| B-1          | DLJ Mtg Acpt Corp 1995-Q02  | RMBS            | Baa2            | 1997                 | 1998                | YES     |
| B-2          | DLJ Mtg Acpt Corp 1995-Q02  | RMBS            | B2              | 1997                 |                     | YES     |
| I B-1        | DLJ Mtg Acpt Corp 1995-Q03  | RMBS            | Baa3            | 1998                 |                     | YES     |
| II B-1       | DLJ Mtg Acpt Corp 1995-Q03  | RMBS            | Baa3            | 1998                 |                     | YES     |
| B-1          | DLJ Mtg Acpt Corp 1995-Q05  | RMBS            | Baa3            | 1998                 |                     | YES     |
| B-2          | DLJ Mtg Acpt Corp 1995-Q05  | RMBS            | B3              | 1997                 | 1998                | YES     |
| B-1          | DLJ Mtg Acpt Corp 1995-Q06  | RMBS            | Baa3            | 1999                 | 1999                | YES     |
| B-2          | DLJ Mtg Acpt Corp 1995-Q06  | RMBS            | B3              | 1997                 | 1998                | YES     |
| M            | DLJ Mtg Acpt Corp 1995-Q08  | RMBS            | Aa3             | 1999                 |                     |         |
| B-1          | DLJ Mtg Acpt Corp 1995-Q08  | RMBS            | Baa3            | 1999                 | 1999                | YES     |
| B-2          | DLJ Mtg Acpt Corp 1995-Q08  | RMBS            | B3              | 1998                 | 1998                | YES     |
| B-2          | DLJ Mtg Acpt Corp 1995-Q10  | RMBS            | Baa3            | 1999                 | 1999                | YES     |
| B-1          | DLJ Mtg Acpt Corp 1995-Q11  | RMBS            | Baa3            | 1996                 | 1999                | YES     |
| B-2          | DLJ Mtg Acpt Corp 1995-Q11  | RMBS            | B3              | 1998                 | 1998                | YES     |
| A-1          | DLJ Mtg Acpt Corp 1995-QE01 | RMBS            | Aaa             | 1999                 | 1999                | YES     |

Figure 37 - Payment Defaults (1993-2002) (Continued)

| Tranche Name | Deal Name  | Collateral Type | Original Rating | Payment Default Year | Ca or C Rating Year | Is MI ? |
|--------------|--|-----------------|-----------------|----------------------|---------------------|---------|
| A-2          | DLJ Mtg Acpt Corp 1995-QE01                          | RMBS            | Aa2             | 1998                 |                     | YES     |
| B            | DLJ Mtg Acpt Corp 1995-QE01                          | RMBS            | Baa2            | 1996                 | 1998                | YES     |
| A-1          | DLJ Mtg Acpt Corp 1995-QE03                          | RMBS            | Aaa             | 1999                 | 1999                | YES     |
| A-2          | DLJ Mtg Acpt Corp 1995-QE03                          | RMBS            | Aa1             | 1998                 |                     | YES     |
| B            | DLJ Mtg Acpt Corp 1995-QE03                          | RMBS            | Baa2            | 1997                 | 1998                | YES     |
| A-1          | DLJ Mtg Acpt Corp 1995-QE08                          | RMBS            | Aaa             | 1999                 |                     | YES     |
| A-2          | DLJ Mtg Acpt Corp 1995-QE08                          | RMBS            | Aa2             | 1999                 | 1999                | YES     |
| B            | DLJ Mtg Acpt Corp 1995-QE08                          | RMBS            | Baa3            | 1997                 | 1998                | YES     |
| A-1          | DLJ Mtg Acpt Corp 1995-QE09                          | RMBS            | Aaa             | 2000                 |                     | YES     |
| A-2          | DLJ Mtg Acpt Corp 1995-QE09                          | RMBS            | Aa2             | 1999                 | 1999                | YES     |
| B            | DLJ Mtg Acpt Corp 1995-QE09                          | RMBS            | Baa3            | 1997                 | 1998                | YES     |
| A-1          | DLJ Mtg Acpt Corp 1995-QE11                          | RMBS            | Aaa             | 1999                 | 1999                | YES     |
| A-2          | DLJ Mtg Acpt Corp 1995-QE11                          | RMBS            | Aa2             | 1999                 |                     | YES     |
| B            | DLJ Mtg Acpt Corp 1995-QE11                          | RMBS            | Baa3            | 1997                 | 1998                | YES     |
| B            | DLJ Mtg Acpt Corp 1995-T07                           | RMBS            | Baa3            | 1996                 |                     | YES     |
| B-1          | DLJ Mtg Acpt Corp 1996-Q1                            | RMBS            | A2              | 1999                 |                     |         |
| B-2          | DLJ Mtg Acpt Corp 1996-Q1                            | RMBS            | Baa3            | 2000                 | 1999                | YES     |
| B-1          | DLJ Mtg Acpt Corp 1996-Q2                            | RMBS            | A2              | 2000                 | 1999                | YES     |
| B-2          | DLJ Mtg Acpt Corp 1996-Q2                            | RMBS            | Baa3            | 1998                 | 1999                | YES     |
| B-2          | DLJ Mtg Acpt Corp 1996-Q4                            | RMBS            | A3              | 1999                 | 1999                | YES     |
| B-3          | DLJ Mtg Acpt Corp 1996-Q4                            | RMBS            | Baa3            | 1998                 | 1999                | YES     |
| B-1          | DLJ Mtg Acpt Corp 1996-Q5                            | RMBS            | A2              | 2002                 |                     |         |
| B-2          | DLJ Mtg Acpt Corp 1996-Q5                            | RMBS            | Baa3            | 1999                 | 1999                | YES     |
| B-3          | DLJ Mtg Acpt Corp 1996-Q5                            | RMBS            | Ba3             | 1998                 |                     | YES     |
| B-2          | DLJ Mtg Acpt Corp 1996-Q6                            | RMBS            | Baa3            | 1999                 | 1999                | YES     |
| M            | DLJ Mtg Acpt Corp 1996-QA                            | RMBS            | Aa3             | 2000                 |                     |         |
| B-1          | DLJ Mtg Acpt Corp 1996-QA                            | RMBS            | Baa3            | 1999                 | 1999                | YES     |
| B-2          | DLJ Mtg Acpt Corp 1996-QA                            | RMBS            | B3              | 1998                 | 1998                | YES     |
| B-2          | DLJ Mtg Acpt Corp 1996-QB                            | RMBS            | Ba2             | 1999                 |                     | YES     |
| A-1          | DLJ Mtg Acpt Corp 1996-QE3                           | RMBS            | Aaa             | 2000                 |                     | YES     |
| A-2          | DLJ Mtg Acpt Corp 1996-QE3                           | RMBS            | Aa2             | 1999                 | 1999                | YES     |
| B            | DLJ Mtg Acpt Corp 1996-QE3                           | RMBS            | A3              | 1998                 | 1998                | YES     |
| B-2          | DLJ Mtg Acpt Corp 1996-QJ                            | RMBS            | Baa3            | 1999                 |                     |         |
| B-3          | DLJ Mtg Acpt Corp 1996-QJ                            | RMBS            | Ba3             | 1999                 |                     | YES     |
| Class A      | DLJ Mtg Acpt Corp 1997-A                             | RMBS            | Aaa             | 2002                 |                     | YES     |
| B-1          | Fund America Investors Corp 1993-H                   | RMBS            | Baa2            | 2000                 |                     | YES     |
| B-2          | Fund America Investors Corp 1993-H                   | RMBS            | B3              | 1996                 |                     | YES     |
| B            | Fund America Investors Corp II 1993-A                | RMBS            | Ba2             | 1999                 |                     | YES     |
| B-1          | Greenwich Capital Acpt 1993-LB2                      | RMBS            | Baa3            | 1997                 |                     | YES     |
| B-1          | Greenwich Capital Acpt 1994-LB3                      | RMBS            | Baa3            | 1999                 |                     | YES     |
| B-1          | Greenwich Capital Acpt 1994-LB6                      | RMBS            | Baa3            | 1999                 |                     | YES     |
| B            | Greenwich Capital Acpt 1996-B                        | RMBS            | Ba2             | 2000                 |                     | YES     |
| C3           | Imperial CMB Trust 1998-1                            | RMBS            | B3              | 1999                 |                     | YES     |
| IIB-1        | MDC Mtg Funding Corp (Greenwich/Long Beach) 1994-LB7 | RMBS            | Baa3            | 1999                 |                     | YES     |
| C            | Morgan Stanley Capital I Inc. Series 1997-P2         | RMBS            | B3              | 2001                 |                     | YES     |

**Figure 37 - Payment Defaults (1993-2002) (Continued)**

| Tranche Name | Deal Name  | Collateral Type | Original Rating | Payment Default Year | Ca or C Rating Year | Is MI ? |
|--------------|--|-----------------|-----------------|----------------------|---------------------|---------|
| A            | Nomura Asset Capital Corp 1994-01                        | RMBS            | Aa2             | 1997                 |                     | YES     |
| B-01         | PaineWebber Mtg Acpt IV 1993-04                          | RMBS            | B1              | 1999                 |                     |         |
| B-4          | Pass-Through Asset Class Execution 1997-I (CWMBS 1997-4) | RMBS            | B2              | 2001                 |                     | YES     |
| B-3          | Prudential Home Mtg Co 1993-17                           | RMBS            | Ba2             | 1999                 |                     | YES     |
| B-1          | Prudential Home Mtg Co 1993-24                           | RMBS            | A2              | 1999                 |                     |         |
| B-2          | Prudential Home Mtg Co 1993-24                           | RMBS            | Ba2             | 1999                 |                     | YES     |
| M            | Prudential Home Mtg Co 1993-59                           | RMBS            | Aa2             | 2000                 |                     |         |
| M            | Prudential Home Mtg Co 1993-60                           | RMBS            | Aa2             | 2000                 |                     |         |
| B3           | Prudential Home Mtg Co 1993-F                            | RMBS            | Ba2             | 1997                 | 1998                | YES     |
| M            | Prudential Home Mtg Co 1994-02                           | RMBS            | Aa2             | 2000                 |                     |         |
| M            | Prudential Home Mtg Co 1994-11                           | RMBS            | Aa3             | 1999                 |                     |         |
| M            | Prudential Home Mtg Co 1994-22                           | RMBS            | Aa3             | 1999                 |                     |         |
| M            | Prudential Home Mtg Co 1994-25                           | RMBS            | Aa3             | 2000                 |                     |         |
| B6           | Prudential Home Mtg Co 1995-C                            | RMBS            | B3              | 1998                 | 1998                | YES     |
| C-2          | Ryland Mtg Sec 1993-06B                                  | RMBS            | Baa3            | 2001                 |                     | YES     |
| D-2          | Ryland Mtg Sec 1993-06B                                  | RMBS            | Ba3             | 1997                 |                     | YES     |
| E-2          | Ryland Mtg Sec 1993-06B                                  | RMBS            | B3              | 1997                 |                     | YES     |
| B-1          | Ryland Mtg Sec 1994-05                                   | RMBS            | Ba2             | 1997                 |                     | YES     |
| B-2          | Ryland Mtg Sec 1994-05                                   | RMBS            | B3              | 1997                 |                     | YES     |
| B-2          | Saxon Mtg Sec 1994-08                                    | RMBS            | B2              | 2000                 |                     | YES     |
| B-2          | Saxon Mtg Sec 1994-10                                    | RMBS            | B2              | 1999                 |                     | YES     |
| Cl. 3        | SBMS 1997-A  | RMBS            | Ba3             | 2001                 |                     | YES     |
| B            | SBMS VII 1993-08   | RMBS            | Ba3             | 1996                 |                     | YES     |
| B-2          | SBMS VII 1994-02   | RMBS            | Ba3             | 1997                 | 1999                | YES     |
| 8-B          | SBMS VII 1994-07 & 1994-08                               | RMBS            | Ba3             | 2000                 | 1999                | YES     |
| 7-B          | SBMS VII 1994-07 & 1994-08                               | RMBS            | Ba3             | 1997                 |                     | YES     |
| 12-B         | SBMS VII 1994-12   | RMBS            | B2              | 1997                 | 1999                | YES     |
| 13-B         | SBMS VII 1994-13   | RMBS            | B2              | 1997                 |                     | YES     |
| B            | SBMS VII 1994-16 (Option One)                            | RMBS            | B1              | 1997                 | 1999                | YES     |
| B            | SBMS VII 1995-01   | RMBS            | Ba2             | 1998                 |                     | YES     |
| B-1          | SBMS VII 1995-B (Option One)                             | RMBS            | Ba3             | 1997                 |                     | YES     |
| B-1          | Securitized Asset Sales Inc 1994-02                      | RMBS            | Baa3            | 1999                 |                     |         |
| M-2          | Securitized Asset Sales Inc 1994-04                      | RMBS            | A2              | 1999                 |                     | YES     |
| M-3          | Securitized Asset Sales Inc 1994-04                      | RMBS            | Baa2            | 1998                 | 1998                | YES     |
| B-1          | Securitized Asset Sales Inc 1994-04                      | RMBS            | Ba2             | 1996                 | 1996                | YES     |
| B-2          | Securitized Asset Sales Inc 1994-04                      | RMBS            | B3              | 1996                 | 1996                | YES     |
| I-B3         | Structured Asset Sec Corp 1995-2                         | RMBS            | Baa2            | 1999                 |                     | YES     |
| B4           | Structured Asset Sec Corp 1996-4 (Norwest)               | RMBS            | Ba2             | 2002                 |                     | YES     |
| B5           | Structured Asset Sec Corp 1996-4 (Norwest)               | RMBS            | B2              | 2001                 |                     | YES     |
| B-4          | Union Planters Mortgage Finance Corp. Series 1998-1      | RMBS            | Ba2             | 2000                 |                     |         |
| B-5          | Union Planters Mortgage Finance Corp. Series 1998-1      | RMBS            | B2              | 2000                 |                     |         |
| B-2          | United Mtg Sec Corp 1993-01                              | RMBS            | NR              | 2000                 |                     | YES     |
| B-2          | United Mtg Sec Corp 1994-01                              | RMBS            | B2              | 1997                 |                     | YES     |

Figure 38 - Ca Or C Rated Securities (1993-2002)

| Tranche Name      | Deal Name                                      | Collateral Type | Original Rating | Payment Default Year | Ca or C Rating Year | Is MI ? |
|-------------------|--|-----------------|-----------------|----------------------|---------------------|---------|
| <b>ABS</b>        |  |                 |                 |                      |                     |         |
| Class B           | Aegis Auto Owner Trust 1995                    | AUTO            | Baa2            |                      | 1998                | YES     |
| Class A           | AutoBond Funding Corporation 1997-A            | AUTO            | A2              |                      | 2000                | YES     |
| Class A           | AutoBond Master Funding Corporation 1997-B     | AUTO            | A3              | 2002                 | 1999                | YES     |
| Class A           | AutoBond Master Funding Corporation 1997-C     | AUTO            | A3              | 2002                 | 1999                | YES     |
| Class A           | AutoBond Receivables Trust 1995-A              | AUTO            | A3              |                      | 2000                | YES     |
| Class A           | AutoBond Receivables Trust 1996-A              | AUTO            | A3              |                      | 2000                | YES     |
| Class A           | AutoBond Receivables Trust 1996-B              | AUTO            | A3              |                      | 2000                | YES     |
| Class A           | AutoBond Receivables Trust 1996-C              | AUTO            | A3              |                      | 2000                | YES     |
| Class A           | AutoBond Receivables Trust 1996-D              | AUTO            | A3              |                      | 2000                | YES     |
| Class B           | AutoFlow 1996-A Grantor Trust                  | AUTO            | Ba2             |                      | 1999                | YES     |
| Class B           | LSI Auto Grantor Trust 1996-B                  | AUTO            | Ba2             | 1998                 | 1999                | YES     |
| Class F           | Captec Franchise Trust 1999-1                  | CREDIT CARDS    | B2              | 2001                 | 2002                | YES     |
| Class B           | Heilig-Meyers Master Trust Series 1998-1       | CREDIT CARDS    | A1              |                      | 2001                | YES     |
| Class C           | Heilig-Meyers Master Trust Series 1998-1       | CREDIT CARDS    | Baa2            |                      | 2001                | YES     |
| Class B           | Heilig-Meyers Master Trust, Series 1998-2      | CREDIT CARDS    | Aa3             |                      | 2001                | YES     |
| Class C           | Heilig-Meyers Master Trust, Series 1998-2      | CREDIT CARDS    | Baa2            |                      | 2001                | YES     |
| Class B           | EMAC Owner Trust 1999-1                        | FRANCHISE LOANS | Aa3             | 2001                 | 2002                | YES     |
| Class C           | EMAC Owner Trust 1999-1                        | FRANCHISE LOANS | A1              | 2001                 | 2002                | YES     |
| Class D           | EMAC Owner Trust 1999-1                        | FRANCHISE LOANS | A3              | 2001                 | 2002                | YES     |
| Class E           | EMAC Owner Trust 1999-1                        | FRANCHISE LOANS | Baa2            | 2001                 | 2002                | YES     |
| Class F           | EMAC Owner Trust 1999-1                        | FRANCHISE LOANS | Ba1             | 2001                 | 2002                | YES     |
| Class G           | EMAC Owner Trust 1999-1                        | FRANCHISE LOANS | Ba3             | 2001                 | 2001                | YES     |
| Class C           | EMAC Owner Trust 2000-1                        | FRANCHISE LOANS | A2              | 2002                 | 2002                | YES     |
| Class D           | EMAC Owner Trust 2000-1                        | FRANCHISE LOANS | Baa2            | 2002                 | 2002                | YES     |
| Class E           | EMAC Owner Trust 2000-1                        | FRANCHISE LOANS | Ba2             | 2002                 | 2002                | YES     |
| Class F           | EMAC Owner Trust 2000-1                        | FRANCHISE LOANS | B2              | 2002                 | 2002                | YES     |
| Class J           | FFCA Secured Franchise Loan Owner Trust 2000-1 | FRANCHISE LOANS | B2              |                      | 2002                | YES     |
| Class D           | Franchise Loan Trust 1998-1                    | FRANCHISE LOANS | Baa2            | 2001                 | 2002                | YES     |
| Class E           | Franchise Loan Trust 1998-1                    | FRANCHISE LOANS | Ba2             | 2001                 | 2001                | YES     |
| Class F           | Franchise Loan Trust 1998-1                    | FRANCHISE LOANS | B2              | 2000                 | 2001                | YES     |
| Class C           | Global Franchise Trust 1998-1                  | FRANCHISE LOANS | A2              | 2002                 | 2002                | YES     |
| Class D           | Global Franchise Trust 1998-1                  | FRANCHISE LOANS | Baa3            | 2002                 | 2002                | YES     |
| Class E           | Peachtree Franchise Loan LLC 1999-A            | FRANCHISE LOANS | Ba2             | 2001                 | 2002                | YES     |
| Class F           | Peachtree Franchise Loan LLC 1999-A            | FRANCHISE LOANS | B2              | 2001                 | 2002                | YES     |
| Class B           | NPF VI, Inc., Series 1998-2                    | HEALTH CARE     | Aa3             |                      | 2002                | YES     |
| Class B           | NPF VI, Inc., Series 1998-4                    | HEALTH CARE     | Aa3             |                      | 2002                | YES     |
| Class B           | NPF VI, Inc., Series 2002-1                    | HEALTH CARE     | Aa3             |                      | 2002                | YES     |
| Class B           | NPF XII, Inc. Series 1999-1                    | HEALTH CARE     | Aa3             |                      | 2002                | YES     |
| Class B           | NPF XII, Inc. Series 1999-3                    | HEALTH CARE     | Aa3             |                      | 2002                | YES     |
| Class B           | NPF XII, Inc., Series 2000-2                   | HEALTH CARE     | Aa3             |                      | 2002                | YES     |
| Class B           | NPF XII, Inc., Series 2000-3                   | HEALTH CARE     | Aa3             |                      | 2002                | YES     |
| Class B           | NPF XII, Inc., Series 2001-1                   | HEALTH CARE     | Aa3             |                      | 2002                | YES     |
| Ser. 2001-2 Cl. B | NPF XII, Inc., Series 2001-2                   | HEALTH CARE     | Aa3             |                      | 2002                | YES     |

**Figure 38 - Ca Or C Rated Securities (1993-2002) (Continued)**

| Tranche Name      | Deal Name  | Collateral Type | Original Rating | Payment Default Year | Ca or C Rating Year | Is MI ? |
|-------------------|--|-----------------|-----------------|----------------------|---------------------|---------|
| Class B           | NPF XII, Inc., Series 2001-3                           | HEALTH CARE     | Aa3             |                      | 2002                | YES     |
| Ser. 2002-1 Cl. B | NPF XII, Inc., Series 2002-1                           | HEALTH CARE     | Aa3             |                      | 2002                | YES     |
| Class B           | NPF XII, Inc., Series 2001-4                           | HEALTH CARE     | Aa3             |                      | 2002                | YES     |
| B                 | ContiMortgage Home Equity Loan Trust 1997-01           | HEL             | Baa3            | 1999                 | 1999                | YES     |
| B3                | GE Capital Mtg Services Inc 1996-HE3                   | HEL             | Ba2             | 2000                 | 2001                | YES     |
| B4                | GE Capital Mtg Services Inc 1996-HE3                   | HEL             | B3              | 2000                 | 1999                | YES     |
| B3                | GE Capital Mtg Services Inc 1997-HE2                   | HEL             | Ba2             | 2000                 | 2001                | YES     |
| B4                | GE Capital Mtg Services Inc 1997-HE2                   | HEL             | B2              | 2000                 | 2001                | YES     |
| B4                | GE Capital Mtg Services Inc 1997-HE3                   | HEL             | B2              | 2001                 | 2001                | YES     |
| B4                | GE Capital Mtg Services Inc 1997-HE4                   | HEL             | B2              | 2001                 | 2001                | YES     |
| B4                | GE Capital Mtg Services Inc 1998-HE1                   | HEL             | B2              | 2001                 | 2001                | YES     |
| B4                | GE Capital Mtg Services Inc 1998-HE2                   | HEL             | B2              | 2001                 | 2001                | YES     |
| B-2               | Impac CMN Trust 1998-1                                 | HEL             | Ba2             | 2000                 | 2001                | YES     |
| D                 | Airplanes Pass Through Trust                           | LEASES          | Ba2             |                      | 2002                | YES     |
| Cl. D             | Centerpoint Funding Company II, L.L.C. Series 2001-1   | LEASES          | Caa1            | 2002                 | 2002                | YES     |
| Class D           | Centerpoint Funding Company II, LLC                    | LEASES          | B3              | 2002                 | 2002                | YES     |
| B-2               | BankAmerica MH Contract 1996-1                         | MH              | Ba2             | 1998                 | 1999                | YES     |
| B-2               | BankAmerica MH Contract 1997-2                         | MH              | Ba2             | 1999                 | 2000                | YES     |
| B-2               | Bombardier Capital Mortgage Securitization Corp 1998-B | MH              | Ba2             | 2002                 | 2002                | YES     |
| B-2               | Bombardier Capital Mortgage Securitization Corp 1999-B | MH              | Ba2             | 2002                 | 2002                | YES     |
| Cl. B-2           | Bombardier Capital Mortgage Securitization Corp 2000-A | MH              | Ba2             | 2002                 | 2002                | YES     |
| Cl. B-2           | Conseco Finance Securitizations Corp. Series 2000-1    | MH              | Baa3            | 2002                 | 2002                | YES     |
| B-2               | Green Tree Financial Corporation MH 1994-07            | MH              | Baa1            | 2002                 | 2002                | YES     |
| B-2               | Green Tree Financial Corporation MH 1995-06            | MH              | Baa1            | 1998                 | 2002                | YES     |
| B-2               | Green Tree Financial Corporation MH 1995-07            | MH              | Baa1            | 1998                 | 2002                | YES     |
| B-2               | Green Tree Financial Corporation MH 1995-08            | MH              | Baa1            | 2002                 | 2002                | YES     |
| B-2               | Green Tree Financial Corporation MH 1995-09            | MH              | Baa1            | 2002                 | 2002                | YES     |
| B-2               | Green Tree Financial Corporation MH 1995-10            | MH              | Baa1            | 2002                 | 2002                | YES     |
| B-2               | Green Tree Financial Corporation MH 1996-01            | MH              | Baa1            | 2002                 | 2002                | YES     |
| B-2               | Green Tree Financial Corporation MH 1996-02            | MH              | Baa1            | 2002                 | 2002                | YES     |
| B-2               | Green Tree Financial Corporation MH 1996-03            | MH              | Baa1            | 2002                 | 2002                | YES     |
| B-2               | Green Tree Financial Corporation MH 1996-04            | MH              | Baa1            | 2002                 | 2002                | YES     |
| B-2               | Green Tree Financial Corporation MH 1996-05            | MH              | Baa1            | 2002                 | 2002                | YES     |
| B-2               | Green Tree Financial Corporation MH 1996-06            | MH              | Baa1            | 2002                 | 2002                | YES     |
| B-2               | Green Tree Financial Corporation MH 1996-07            | MH              | Baa1            | 2002                 | 2002                | YES     |
| B-2               | Green Tree Financial Corporation MH 1996-08            | MH              | Baa1            | 2002                 | 2002                | YES     |
| B-2               | Green Tree Financial Corporation MH 1996-09            | MH              | Baa1            | 2002                 | 2002                | YES     |
| B-2               | Green Tree Financial Corporation MH 1997-02            | MH              | Baa1            | 2002                 | 2002                | YES     |
| B-2               | Green Tree Financial Corporation MH 1997-03            | MH              | Baa1            | 2002                 | 2002                | YES     |
| B-2               | Green Tree Financial Corporation MH 1997-04            | MH              | Baa1            | 2002                 | 2002                | YES     |
| B-2               | Green Tree Financial Corporation MH 1997-05            | MH              | Baa1            | 2002                 | 2002                | YES     |
| B-2               | Green Tree Financial Corporation MH 1998-01            | MH              | Baa3            | 2002                 | 2002                | YES     |
| B-2               | Green Tree Financial Corporation MH 1998-02            | MH              | Baa3            | 2002                 | 2002                | YES     |
| B-2               | Green Tree Financial Corporation MH 1998-04            | MH              | Baa3            | 2002                 | 2002                | YES     |
| B-2               | Green Tree Financial Corporation MH 1998-05            | MH              | Baa3            | 2002                 | 2002                | YES     |

Figure 38 - Ca Or C Rated Securities (1993-2002) (Continued)

| Tranche Name | Deal Name                                     | Collateral Type | Original Rating | Payment Default Year | Ca or C Rating Year | Is MI ? |
|--------------|---|-----------------|-----------------|----------------------|---------------------|---------|
| B-2          | Green Tree Financial Corporation MH 1998-07   | MH              | Baa3            | 2002                 | 2002                | YES     |
| B-2          | Green Tree Financial Corporation MH 1998-08   | MH              | Ba1             | 2002                 | 2002                | YES     |
| B-2          | UCFC Funding Corporation 1996-1               | MH              | Ba2             | 2000                 | 2000                | YES     |
| B-2          | UCFC Funding Corporation 1997-1               | MH              | Ba1             | 2000                 | 2000                | YES     |
| B-2          | UCFC Funding Corporation 1997-2               | MH              | Ba1             | 2001                 | 2000                | YES     |
| B-2          | UCFC Funding Corporation 1997-3               | MH              | Ba1             | 2001                 | 2000                | YES     |
| Class A      | UCFC Funding Corporation 1997-RS1             | MH              | Ba1             |                      | 2000                | YES     |
| 7.90%        | Securitized Multiple Asset Rated Trust 1996-4 | OTHER           | A2              |                      | 1999                | YES     |
| Class M-1    | Conseco Finance Vehicle Trust 2000-B          | TRUCKS          | Aa3             |                      | 2002                | YES     |
| Class M-2    | Conseco Finance Vehicle Trust 2000-B          | TRUCKS          | A3              |                      | 2002                | YES     |
| Class B      | Conseco Finance Vehicle Trust 2000-B          | TRUCKS          | Baa3            |                      | 2002                | YES     |
| <b>CMBS</b>  |   |                 |                 |                      |                     |         |
| B            | DLJ Mtg Acpt Corp 1993-MF02                   | CMBS            | Baa2            |                      | 1994                | YES     |
| J            | Morgan Stanley Capital I Inc. 1998-CF1        | CMBS            | B1              | 2001                 | 2002                | YES     |
| K            | Morgan Stanley Capital I Inc. 1998-CF1        | CMBS            | B2              | 2001                 | 2002                | YES     |
| L            | Morgan Stanley Capital I Inc. 1998-CF1        | CMBS            | B3              | 2001                 | 2002                | YES     |
| M            | Morgan Stanley Capital I Inc. 1998-CF1        | CMBS            | Caa2            | 2001                 | 2001                | YES     |
| <b>RMBS</b>  |   |                 |                 |                      |                     |         |
| 4A           | American Mtg Trust 1993-04                    | RMBS            | Ba2             | 1996                 | 1996                | YES     |
| B-1          | DLJ Mtg Acpt Corp 1993-Q03                    | RMBS            | Baa2            | 1997                 | 1998                | YES     |
| B-1          | DLJ Mtg Acpt Corp 1993-Q06                    | RMBS            | Baa2            | 1998                 | 1998                | YES     |
| B-1          | DLJ Mtg Acpt Corp 1993-Q13                    | RMBS            | Baa3            | 1998                 | 1998                | YES     |
| B-1          | DLJ Mtg Acpt Corp 1993-Q16                    | RMBS            | Baa3            | 1998                 | 1998                | YES     |
| B-1          | DLJ Mtg Acpt Corp 1993-QE01                   | RMBS            | Baa2            | 1996                 | 1996                | YES     |
| B-1          | DLJ Mtg Acpt Corp 1993-QE05                   | RMBS            | Baa2            | 1996                 | 1996                | YES     |
| B-1          | DLJ Mtg Acpt Corp 1993-QE11                   | RMBS            | Baa2            | 1996                 | 1996                | YES     |
| I B-2        | DLJ Mtg Acpt Corp 1994-Q13                    | RMBS            | B3              | 1997                 | 1998                | YES     |
| II B-1       | DLJ Mtg Acpt Corp 1994-Q13                    | RMBS            | Baa3            | 1999                 | 1999                | YES     |
| II B-2       | DLJ Mtg Acpt Corp 1994-Q13                    | RMBS            | B3              | 1997                 | 1998                | YES     |
| III B-1      | DLJ Mtg Acpt Corp 1994-Q13                    | RMBS            | Baa3            | 1997                 | 1998                | YES     |
| I B-1        | DLJ Mtg Acpt Corp 1994-Q16                    | RMBS            | Baa3            | 1998                 | 1998                | YES     |
| II B-1       | DLJ Mtg Acpt Corp 1994-Q16                    | RMBS            | Baa3            | 1997                 | 1998                | YES     |
| B-1          | DLJ Mtg Acpt Corp 1994-QE01                   | RMBS            | Baa2            | 1997                 | 1998                | YES     |
| B-2          | DLJ Mtg Acpt Corp 1994-QE01                   | RMBS            | B2              | 1997                 | 1996                | YES     |
| B-1          | DLJ Mtg Acpt Corp 1994-QE02                   | RMBS            | Baa2            | 1997                 | 1998                | YES     |
| B-1          | DLJ Mtg Acpt Corp 1994-QE04                   | RMBS            | Baa2            | 1997                 | 1998                | YES     |
| A-2          | DLJ Mtg Acpt Corp 1994-QE05                   | RMBS            | Aa1             | 1999                 | 1999                | YES     |
| B-1          | DLJ Mtg Acpt Corp 1994-QE05                   | RMBS            | Baa2            | 1997                 | 1998                | YES     |
| B-2          | DLJ Mtg Acpt Corp 1994-QE05                   | RMBS            | B1              | 1996                 | 1996                | YES     |
| A-1          | DLJ Mtg Acpt Corp 1994-QE07                   | RMBS            | Aaa             | 1999                 | 1999                | YES     |
| B-1          | DLJ Mtg Acpt Corp 1994-QE07                   | RMBS            | Baa1            | 1997                 | 1998                | YES     |
| B-2          | DLJ Mtg Acpt Corp 1994-QE07                   | RMBS            | Ba3             | 1996                 | 1996                | YES     |
| B-1          | DLJ Mtg Acpt Corp 1995-Q01                    | RMBS            | Baa2            | 1998                 | 1998                | YES     |

**Figure 38 - Ca Or C Rated Securities (1993-2002) (Continued)**

| Tranche Name | Deal Name                           | Collateral Type | Original Rating | Payment Default Year | Ca or C Rating Year | Is MI ? |
|--------------|-------------------------------------|-----------------|-----------------|----------------------|---------------------|---------|
| B-1          | DLJ Mtg Acpt Corp 1995-Q02          | RMBS            | Baa2            | 1997                 | 1998                | YES     |
| B-2          | DLJ Mtg Acpt Corp 1995-Q05          | RMBS            | B3              | 1997                 | 1998                | YES     |
| B-1          | DLJ Mtg Acpt Corp 1995-Q06          | RMBS            | Baa3            | 1999                 | 1999                | YES     |
| B-2          | DLJ Mtg Acpt Corp 1995-Q06          | RMBS            | B3              | 1997                 | 1998                | YES     |
| B-1          | DLJ Mtg Acpt Corp 1995-Q08          | RMBS            | Baa3            | 1999                 | 1999                | YES     |
| B-2          | DLJ Mtg Acpt Corp 1995-Q08          | RMBS            | B3              | 1998                 | 1998                | YES     |
| B-2          | DLJ Mtg Acpt Corp 1995-Q10          | RMBS            | Baa3            | 1999                 | 1999                | YES     |
| B-1          | DLJ Mtg Acpt Corp 1995-Q11          | RMBS            | Baa3            | 1996                 | 1999                | YES     |
| B-2          | DLJ Mtg Acpt Corp 1995-Q11          | RMBS            | B3              | 1998                 | 1998                | YES     |
| A-1          | DLJ Mtg Acpt Corp 1995-QE01         | RMBS            | Aaa             | 1999                 | 1999                | YES     |
| B            | DLJ Mtg Acpt Corp 1995-QE01         | RMBS            | Baa2            | 1996                 | 1998                | YES     |
| A-1          | DLJ Mtg Acpt Corp 1995-QE03         | RMBS            | Aaa             | 1999                 | 1999                | YES     |
| B            | DLJ Mtg Acpt Corp 1995-QE03         | RMBS            | Baa2            | 1997                 | 1998                | YES     |
| A-2          | DLJ Mtg Acpt Corp 1995-QE08         | RMBS            | Aa2             | 1999                 | 1999                | YES     |
| B            | DLJ Mtg Acpt Corp 1995-QE08         | RMBS            | Baa3            | 1997                 | 1998                | YES     |
| A-2          | DLJ Mtg Acpt Corp 1995-QE09         | RMBS            | Aa2             | 1999                 | 1999                | YES     |
| B            | DLJ Mtg Acpt Corp 1995-QE09         | RMBS            | Baa3            | 1997                 | 1998                | YES     |
| A-1          | DLJ Mtg Acpt Corp 1995-QE11         | RMBS            | Aaa             | 1999                 | 1999                | YES     |
| B            | DLJ Mtg Acpt Corp 1995-QE11         | RMBS            | Baa3            | 1997                 | 1998                | YES     |
| B-2          | DLJ Mtg Acpt Corp 1996-Q1           | RMBS            | Baa3            | 2000                 | 1999                | YES     |
| B-1          | DLJ Mtg Acpt Corp 1996-Q2           | RMBS            | A2              | 2000                 | 1999                | YES     |
| B-2          | DLJ Mtg Acpt Corp 1996-Q2           | RMBS            | Baa3            | 1998                 | 1999                | YES     |
| B-2          | DLJ Mtg Acpt Corp 1996-Q4           | RMBS            | A3              | 1999                 | 1999                | YES     |
| B-3          | DLJ Mtg Acpt Corp 1996-Q4           | RMBS            | Baa3            | 1998                 | 1999                | YES     |
| B-2          | DLJ Mtg Acpt Corp 1996-Q5           | RMBS            | Baa3            | 1999                 | 1999                | YES     |
| B-2          | DLJ Mtg Acpt Corp 1996-Q6           | RMBS            | Baa3            | 1999                 | 1999                | YES     |
| B-1          | DLJ Mtg Acpt Corp 1996-QA           | RMBS            | Baa3            | 1999                 | 1999                | YES     |
| B-2          | DLJ Mtg Acpt Corp 1996-QA           | RMBS            | B3              | 1998                 | 1998                | YES     |
| A-2          | DLJ Mtg Acpt Corp 1996-QE3          | RMBS            | Aa2             | 1999                 | 1999                | YES     |
| B            | DLJ Mtg Acpt Corp 1996-QE3          | RMBS            | A3              | 1998                 | 1998                | YES     |
| B3           | Prudential Home Mtg Co 1993-F       | RMBS            | Ba2             | 1997                 | 1998                | YES     |
| B6           | Prudential Home Mtg Co 1995-C       | RMBS            | B3              | 1998                 | 1998                | YES     |
| B-2          | SBMS VII 1994-02                    | RMBS            | Ba3             | 1997                 | 1999                | YES     |
| 8-B          | SBMS VII 1994-07 & 1994-08          | RMBS            | Ba3             | 2000                 | 1999                | YES     |
| 12-B         | SBMS VII 1994-12                    | RMBS            | B2              | 1997                 | 1999                | YES     |
| B            | SBMS VII 1994-16 (Option One)       | RMBS            | B1              | 1997                 | 1999                | YES     |
| M-3          | Securitized Asset Sales Inc 1994-04 | RMBS            | Baa2            | 1998                 | 1998                | YES     |
| B-1          | Securitized Asset Sales Inc 1994-04 | RMBS            | Ba2             | 1996                 | 1996                | YES     |
| B-2          | Securitized Asset Sales Inc 1994-04 | RMBS            | B3              | 1996                 | 1996                | YES     |



## Related Research

### Special Comment

Structured Finance Rating Transitions: 1983-2002, Comparisons with Corporate Ratings and Across Sectors, January 2003 (#77291)

Default & Recovery Rates of Corporate Bond Issuers, A Statistical Review of Moody's Ratings Performance, 1970-2001", February 2002 (#74171)

### Special Report

Commonly Asked CDO Questions: Moody's Responds, February and July 2001 (#SF9991).

Moody's Approach to Rating Multisector CDOs, September 2000 (#SF9050).

CMBS: Smoothing Recoveries of Servicer Advances to Minimize Interest Shortfalls, July 2003 (#SF24762).

Moody's Approach to Rating Residential Mortgage Pass-Through Securities, November 1996 (#SF4915).

Moody's Approach to Rating Synthetic CDOs, July 2003 (#SF24581).

Moody's Approach to Monitoring Structured Finance Ratings in Japan, February 2003 (#SF20046).

Moody's Approach to Rating Synthetic Resecuritizations, October 2003 (#SF27650).

*To access any of these reports, click on the entry above. Note that these references are current as of the date of publication of this report and that more recent reports may be available. All research may not be available to all clients.*

PAGE INTENTIONALLY LEFT BLANK

To order reprints of this report (100 copies minimum), please call 1.212.553.1658.  
Report Number: 80247

**Authors**

Jian Hu  
Richard Cantor

**Editor**

David Veasey

**Associate Analyst**

Alexandra Neely

**Production Specialist**

John Tzanos

© Copyright 2003, Moody's Investors Service, Inc. and/or its licensors including Moody's Assurance Company, Inc. (together, "MOODY'S"). All rights reserved. **ALL INFORMATION CONTAINED HEREIN IS PROTECTED BY COPYRIGHT LAW AND NONE OF SUCH INFORMATION MAY BE COPIED OR OTHERWISE REPRODUCED, REPACKAGED, FURTHER TRANSMITTED, TRANSFERRED, DISSEMINATED, REDISTRIBUTED OR RESOLD, OR STORED FOR SUBSEQUENT USE FOR ANY SUCH PURPOSE, IN WHOLE OR IN PART, IN ANY FORM OR MANNER OR BY ANY MEANS WHATSOEVER, BY ANY PERSON WITHOUT MOODY'S PRIOR WRITTEN CONSENT.** All information contained herein is obtained by MOODY'S from sources believed by it to be accurate and reliable. Because of the possibility of human or mechanical error as well as other factors, however, such information is provided "as is" without warranty of any kind and MOODY'S, in particular, makes no representation or warranty, express or implied, as to the accuracy, timeliness, completeness, merchantability or fitness for any particular purpose of any such information. Under no circumstances shall MOODY'S have any liability to any person or entity for (a) any loss or damage in whole or in part caused by, resulting from, or relating to, any error (negligent or otherwise) or other circumstance or contingency within or outside the control of MOODY'S or any of its directors, officers, employees or agents in connection with the procurement, collection, compilation, analysis, interpretation, communication, publication or delivery of any such information, or (b) any direct, indirect, special, consequential, compensatory or incidental damages whatsoever (including without limitation, lost profits), even if MOODY'S is advised in advance of the possibility of such damages, resulting from the use of or inability to use, any such information. The credit ratings, if any, constituting part of the information contained herein are, and must be construed solely as, statements of opinion and not statements of fact or recommendations to purchase, sell or hold any securities. **NO WARRANTY, EXPRESS OR IMPLIED, AS TO THE ACCURACY, TIMELINESS, COMPLETENESS, MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OF ANY SUCH RATING OR OTHER OPINION OR INFORMATION IS GIVEN OR MADE BY MOODY'S IN ANY FORM OR MANNER WHATSOEVER.** Each rating or other opinion must be weighed solely as one factor in any investment decision made by or on behalf of any user of the information contained herein, and each such user must accordingly make its own study and evaluation of each security and of each issuer and guarantor of, and each provider of credit support for, each security that it may consider purchasing, holding or selling. MOODY'S hereby discloses that most issuers of debt securities (including corporate and municipal bonds, debentures, notes and commercial paper) and preferred stock rated by MOODY'S have, prior to assignment of any rating, agreed to pay to MOODY'S for appraisal and rating services rendered by it fees ranging from \$1,500 to \$1,800,000.

Contact

Phone

New York

Jian Hu  
Richard Cantor  
Alexandra Neely

1.212.553.1653

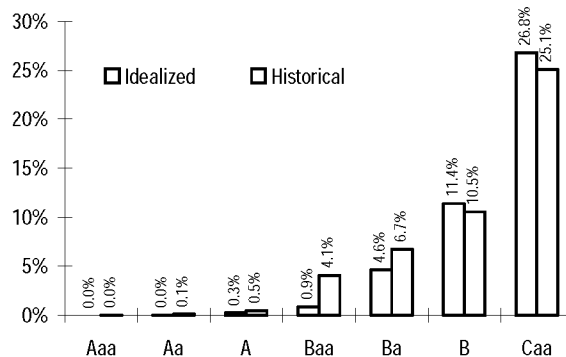
## Default & Loss Rates of Structured Finance Securities: 1993-2003

### Summary Opinion

This *Special Comment* presents Moody's first study of the realized loss rates and rating performance of US ABS, CMBS, and RMBS securities. Highlights of this study include:

- During 1993-2003, 561 structured securities were materially impaired, representing about 3.2% of all structured finance securities issued during that period. As a share of original balances, however, only 0.7% (\$10.7 billion) was materially impaired, because lower rated securities, which had higher material impairment rates, tended to be issued with smaller balances than were highly rated securities.
- In 2003 alone, 189 securities became impaired, comprising \$5.4 billion based on their original balances. These notes represented about 1.7% of all outstanding structured finance securities at the beginning of 2003, or about 0.5% by their original balance.
- Final loss severity rates on defaulted securities backed by residential mortgages and home equity loans during 1988–2003 have averaged 48.1% as a share of default-date balances and 31.9% as a share of original balances, according to Moody's structured finance loss-given-default model that projects final loss severity based on loss severity to date information. Loss severity rates appear to be strongly correlated with both original ratings and ratings at default.
- Moody's ratings have been highly predictive of multi-year loss rates, as they have been highly correlated with both default frequencies and loss severities in the event of default.
- Loss rates measured on the basis of cohort ratings have on average been higher (about 1.9% over five years) than loss rates measured on the basis of original ratings (about 1.1% over five years) mainly because of a seasoning pattern evident in default rates. The likelihood of default generally rises during the first two years of a security's life, peaks in the third year, and declines thereafter. Moderately seasoned securities, therefore, appear to be more risky than newly issued securities within the same rating category.
- Historical loss rates have closely tracked Moody's idealized (targeted) loss rates for most rating categories (see Figure 1.) One exception is the Baa rating category, which has suffered higher loss rates than expected based on idealized loss rates, due in large part to the poor performance of Baa-rated securities issued in the manufactured housing loans sector.
- Structured finance ratings are comparable to corporate finance ratings with respect to relative rating accuracy and with respect to average loss rates for most rating categories. In addition, structured finance ratings have a higher investment-grade loss rate, higher average rating prior to default, lower frequency of rating changes, and larger magnitude of change when rating changes do occur.

**Figure 1 – Structured Finance Historical Five-Year Loss Rates (1993-2003) Measured on a Cohort Basis, Compared with Moody's Idealized Loss Rates**



---

---

# Table of Contents

---

|   | Page |
|---|------|
| Introduction .....  | 3    |
| Review of Structured Finance Impairments .....  | 4    |
| Number and Dollar Volume of Impairments – About 3% Were Materially Impaired .....                               | 4    |
| Distribution of Impairments by Sector- ABS Sector Led in Number of Impairments .....                            | 5    |
| Impairment Experiences in 2003 – A Record Year for Impairments .....  | 6    |
| Historical Impairment Rates .....   | 7    |
| One-Year Impairment Rates – Increased Markedly in 2003 .....  | 7    |
| Multi-Year Impairment Rates – Corresponded Closely to Moody’s Credit Ratings .....                              | 7    |
| Impairment Rates by Rating at Origination – Moderately Seasoned Securities Had Higher Impairment Rates .....    | 8    |
| Loss Severity Rates Given Default .....   | 10   |
| Final Loss Severity Rates – Strongly Correlated with Credit Ratings at Default and Origination .....            | 10   |
| Multi-Year Average Loss Severity Rates – Properly Rank-Ordered by Credit Rating .....                           | 11   |
| Multi-Year Cumulative Loss Rates .....  | 12   |
| Loss Rates by Cohort Rating – Higher Rated Securities Sustained Lower Losses .....                              | 12   |
| Loss Rates by Original Rating – Differences Explained by Seasoning .....  | 12   |
| Comparisons with Idealized Loss Rates – Historical Loss Rates Tracked Idealized Rates .....                     | 14   |
| Structured Finance Ratings Performance .....  | 14   |
| CAP Curves and Accuracy Ratios Adjusted for LGD – Measures of Relative Rating Accuracy .....                    | 15   |
| Investment-Grade Loss Rate and Average Rating Prior to Impairment – Measures of Absolute Rating Accuracy .....  | 16   |
| Frequencies of Rating Changes and Rating Reversals – Measures of Rating Stability .....                         | 16   |
| Comparisons between Structured and Corporate Ratings .....  | 17   |
| Default and Impairment Rates – Impairment Rates by Cohort Rating Generally Higher in Structured .....           | 17   |
| Loss-Given-Default – Markedly Lower and Better Ordered by Rating in Structured .....                            | 18   |
| Realized Loss Rates – Similar for Ratings A or Above, Higher for Baa, Lower for Ba or Below in Structured ..... | 18   |
| Accuracy Ratios – Similar in Structured and Corporate .....   | 19   |
| Concluding Remarks .....  | 20   |
| Appendix .....  | 21   |
| Related Research .....  | 38   |

## Introduction

---

In two previous *Special Comments*, Moody's presented default rate and loss severity rate (given default) findings, separately. In this *Special Comment*, we:

- Update the prior default and loss severity rate results through year-end 2003,
- Calculate historical loss rates,
- Compare historical loss rates to their idealized values,<sup>1</sup>
- Measure the accuracy and stability of Moody's structured finance ratings, and
- Compare our findings in structured finance with those in corporate finance.

Moody's published its first structured finance default study in December 2003.<sup>2</sup> In that study, Moody's defined two categories of default – payment default and material impairment. Payment default includes both interest shortfalls and loss of principal, regardless of whether defaults are subsequently cured. Material impairment, however, excludes cured payment defaults because they are often temporary and inconsequential, and includes securities that have been rated Ca or C but are not yet in payment default.

Material impairment (or impairment, for simplicity) is a key concept in the study of structured finance rating performance, because Moody's structured finance ratings aim at differentiating relative expected loss rates, not pure default risk, among structured securities.<sup>3</sup> Using a data sample of securities issued between 1993 and 2002, the December 2003 study found impairment rates to be substantially different across rating categories and lower ratings to be correlated with high impairment rates.

In a more recent *Special Comment* published in April 2004,<sup>4</sup> Moody's presented its research findings on the measurement of loss severity rates (or loss given default, LGD) in structured finance. Because defaults in structured transactions do not typically imply liquidation, realized losses gradually accrue after the initial event of default and partial payments to security holders may continue over time. Final losses on defaulted securities are therefore typically not available for a long period of time after default. Final loss severity rate statistics are therefore available for only a small number of defaulted securities that were either quickly written down or defaulted close to their final maturity dates.

In the April 2004 study, Moody's proposed a method of estimating final loss severity rates for securities that have not matured or had their principal balances written down to zero.<sup>5</sup> The method blends both static factors such as tranche size and time from origination to default and dynamic factors such as the cumulative loss to date as a share of principal balance reduction to date to derive estimates of final loss severity rates. In a sample of both matured and non-matured defaulted residential mortgage-backed securities (RMBS) and home-equity-loan-backed (HEL-backed) securities issued from 1988 to 2002, Moody's found higher final loss severity rates were often associated with lower credit ratings.

Because of the lack of data on the final loss severity rates of defaulted securities in asset classes outside of RMBS and HEL, this study assumes that defaulted securities in commercial mortgage-backed securities (CMBS) and non-HEL ABS would, on average, sustain the same level of loss severity by rating category as those in RMBS and HEL. This assumption is based on Moody's research on loss severity rates to date for defaulted CMBS and non-HEL ABS securities over different seasoning horizons and Moody's study of final loss severity rates for defaulted RMBS and HEL securities.<sup>6</sup>

Moody's measures the accuracy and stability of its structured finance ratings using essentially the same metrics that are used to measure the performance of corporate credit ratings.<sup>7</sup> To measure accuracy, Moody's analyzes cumulative accuracy profiles, accuracy ratios, investment-grade default rates, and average ratings prior to default. Moody's has modified these metrics to take into account loss severity as well as default probability, because structured finance ratings target loss rates rather than default rates. To measure stability, Moody's tracks the frequencies of rating changes, in general, and large rating changes and rating reversals, in particular.

---

1. Idealized loss rates are a set of cumulative loss rates tabled by alpha-numeric rating and by time horizon (in number of years). They are the targeted expected loss rates for many Moody's rated structured securities. The idealized loss rate table is provided in the Appendix (Figure 27.)

2. "Payment Defaults and Material Impairments of U.S. Structured Finance Securities: 1993-2002," Moody's Special Comment, December 2003.

3. Moody's does not offer a "D (or default)" rating. Additional discussions about credit events in structured transactions can also be found in Moody's Structured Finance Rating Methodology papers, "Moody's Approach to Rating Synthetic Resecurizations," October 2003, and "Moody's Approach to Rating Multisector CDOs," September 2000, and Structured Finance Special Report, "Response to Frequently Asked CDO Questions (second of series)," July 2001.

4. "Measuring Loss Severity Rates of Defaulted Residential Mortgage-Backed Securities: A Methodology," Moody's Special Comment, April 2004.

5. A defaulted security is called "matured" if it has no principal balance outstanding, which can be the result of a write-down or a normal pay-down.

6. Some preliminary research findings on the loss severity rates to date for defaulted ABS and CMBS securities were presented in the loss severity rate section of Moody's structured finance default study published in December 2003. Moody's will continue to examine these findings in future reports once more loss observations become available across all structured finance asset classes.

7. For discussions on Moody's corporate bond rating performance, please see Moody's Special Comment, "Measuring the Performance of Corporate Bond Ratings," April 2003.

Moody's defines default, calculates default and loss rates, and measures performance using similar methods in its structured finance and corporate finance loss studies alike.<sup>8</sup> The results, however, may not be directly comparable to statistics calculated by other researchers, who may employ different methods. Many of the following results are also presented on a disaggregated basis, by sector, in the Appendix.

## Review of Structured Finance Impairments

### Number and Dollar Volume of Impairments – About 3% Were Materially Impaired

Among all US ABS, RMBS and CMBS securities issued between 1993 and 2003, 604 experienced payment defaults. Of these, 130 were cured and 474 remained uncured as of April 2004. There are an additional 87 securities that were issued during these years and rated Ca or C that have not yet gone into default; however, they are all but certain to do so in the future. As a result, 561 securities (from 327 deals) became materially impaired during the sample period. These figures represent approximately 3.2% of the securities studied in the sample.<sup>9</sup>

When measured by their original balance, the total impaired amount related to these securities was \$10.7 billion, or roughly 0.66% of the original balance of all securities in the sample.<sup>10</sup> When measured by their principal balance at the time of default, the total impaired amount was \$7.3 billion, in other words, these securities in aggregate had paid \$3.4 billion in principal before becoming impaired. Figure 2 presents a summary of all defaults and impairments since 1993.

**Figure 2 – Number and Dollar Volume of Defaults and Impairments, 1993-2003**

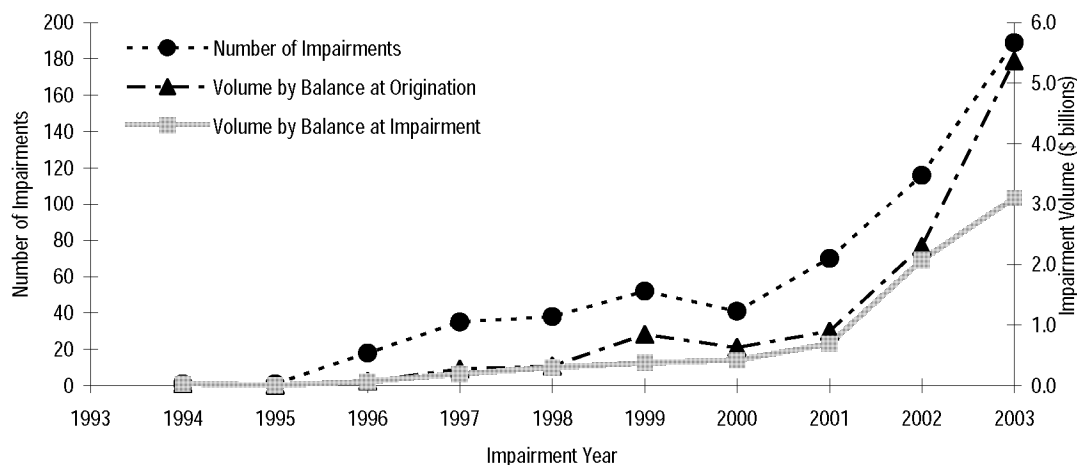
| Data Sample:<br>US ABS/CMBS/RMBS           | Payment Defaults<br>(by number of securities) | Material Impairments<br>(by number of securities) | Material Impairments<br>(by original balance) |
|--|---|---|---|
| Cured Payment Default                      | 130   | NA  | NA  |
| Uncured Payment Default                    | 474   | 474   | \$8.2 billion                                 |
| Ca or C rated but not in payment default   | NA  | 87  | \$2.5 billion                                 |
| Total Defaults or Impairments              | 604   | 561   | \$10.7 billion                                |
| Total number or amount of rated securities | 17,699  | 17,699  | \$1,625 billion                               |
| Lifetime default or impairment rate        | 3.4%  | 3.2%  | 0.66%   |

*Note: "Lifetime" default or impairment rate is the ratio of the number or amount of defaulted or impaired securities over the total number or amount of rated securities issued during the sample period. Unlike default or impairment rates to be discussed in later sections, this ratio is measured without any specific horizons or any given rating categories. Over time, some additional securities within this sample are likely to become defaulted or impaired.*

As indicated, the majority of material impairments were the result of payment default events (either interest shortfalls or principal write-downs) that were not cured. The removal of cured defaults and the addition of Ca/C rated securities not in payment default had an off-setting effect on the "lifetime" impairment rate, resulting in a similar "lifetime" payment default rate and material impairment rate.

Over time, both the number and dollar volume of impaired securities have risen, especially since 2001. Figure 3 depicts the number and dollar volume (both original balance and balance at default) of materially impaired structured finance securities from 1993 to 2003.

**Figure 3 – Number and Dollar Volume of Materially Impaired Securities**



8. Comparisons of default and loss rates across the corporate and structured sectors are provided later in this study.

9. Like our first default study, this paper does not include CDOs due to the limited availability of their bond performance data.

10. Pari passu securities are collapsed into one tranche that has the longest maturity. The total impairment rate drops to about 0.3% when original balances of all pari passu tranches are included in the calculation.

As shown in Figure 3, the largest number and amount of material impairments were recorded for 2003. The number of impaired securities rose by 63% from 2002 to 2003. Based on principal balances, the increases were 134% by original balance and 50% by balance at impairment. By contrast, the increases from 2001 to 2002 were 66% by the number of impaired securities, 156% by original balance and 200% by balance at impairment of impaired securities.

The dramatic increases in the number and dollar volume of structured finance impairments in 2002 and 2003 can be largely attributable to the woes in the manufactured housing loans and franchise loans sectors, which were hit hard by the recent economic downturn. Other contributing factors for the increases include: (1) the failures of National Century Financial Enterprises (NCFE), Heilig-Meyers, and DVI, which resulted in a considerable number of impairments in the ABS sector; (2) the increase in the number of impaired securities backed by subprime mortgages (HELs, included in the ABS category), and (3) the increase in the number of CMBS securities experiencing interest shortfalls, which were partially the results of the poor performance of the corporate sector in 2001 and 2002.

We note that the performance of the securities in most of these structured finance sectors is correlated with (normally lags) the performance of the corporate entities. With the corporate environment improving significantly since 2003 and the housing market remaining strong, Moody's expects the upward trend of impairments that was seen in 2002 and 2003 to slow down in 2004.

### ***Distribution of Impairments by Sector- ABS Sector Led in Number of Impairments***

About 64% of all structured finance securities that became impaired during 1993-2003 were in the ABS sector. This was mainly because a large number of securities backed by manufactured housing loans and franchise loans defaulted and were thereby materially impaired. In fact, impairments in these two asset classes accounted for more than 65% of all ABS impairments.<sup>11</sup> Figure 4 shows the distribution of defaults and impairments across three major sectors: ABS, CMBS and RMBS.

**Figure 4 – Distribution of Defaults and Impairments by Sector, 1993-2003**

|  | <b>Total</b> | <b>ABS</b> | <b>CMBS</b> | <b>RMBS</b> |
|--|--------------|------------|-------------|-------------|
| Cured Defaults                                       | 130          | 18         | 91          | 21          |
| Uncured Defaults                                     | 474          | 278        | 62          | 134         |
| Ca/C but not in default                              | 87           | 83         | 4           | 0           |
| Total Number of Defaults                             | 604          | 296        | 153         | 155         |
| Total Number of Impairments                          | 561          | 361        | 66          | 134         |
| Total Number of Securities Studied                   | 17,699       | 8,977      | 3,430       | 5,292       |
| Total Number of Impaired Deals                       | 327          | 204        | 38          | 85          |
| Total Number of Deals Studied                        | 5,407        | 3,301      | 465         | 1,641       |
| Lifetime Default Rate (share of securities)          | 3.4%         | 3.3%       | 4.5%        | 2.9%        |
| Lifetime Impairment Rate (share of securities)       | 3.2%         | 4.0%       | 1.9%        | 2.5%        |
| Lifetime Impairment Rate (share of original balance) | 0.66%        | 0.68%      | 0.60%       | 0.60%       |
| Lifetime Impairment Rate (share of deals)            | 6.0%         | 6.2%       | 8.2%        | 5.2%        |

*Note: "Lifetime" default or impairment rate is the ratio of the number (or amount) of defaulted or impaired securities or deals over the total number (or amount) of securities or deals, respectively, issued during the sample period.*

Figure 4 reveals that "lifetime" default and impairment rates as a share of securities were somewhat different across the three major sectors studied. The ABS sector is both the largest sector and has had the greatest number of defaulted and impaired securities. In particular, it accounts for almost all the cases of securities that have been rated Ca or C, but have not yet experienced an outright payment default, as identified through available trustee reports.

These Ca- or C-rated issues include securities backed by retail credit card transactions sponsored by Heilig-Meyers, healthcare receivables deals sponsored by National Century including NPF VI and NPF XII, securities from a large number of Green Tree/Conseco manufactured housing deals, and a small number of securities backed by auto loans and equipment leases.

Confirming the findings in Moody's first structured finance default study, Figure 4 shows that, as a share of securities issued, the CMBS sector continues to have the lowest lifetime impairment rate, but the highest payment default rate of all the sectors studied. This is due to the large number of CMBS securities that experienced short-term interest shortfalls (and hence were payment defaults), but did not become materially impaired for the reason that the shortfalls were quickly cured.<sup>12</sup>

11. A breakdown of impairments in the ABS sector by asset type is shown in the Appendix (Figure 29).



The lifetime impairment rate as a share of securities in the RMBS sector (2.5%) is lower than the impairment rate in the ABS sector (4.0%), but higher than the CMBS sector's rate (1.9%). When measured by original balances, however, the lifetime impairment rates were similar across these three sectors, with a 0.60% impairment rate for both the CMBS and RMBS sectors and a 0.68% impairment rate for the ABS sector.

The lifetime impairment rate, as a share of deals, was around 6.0% for all three sectors combined. The CMBS sector had an impairment rate of about 8.2%, whereas the RMBS sector had a lower impairment rate of about 5.2%. ABS was at 6.2%.

### ***Impairment Experiences in 2003 – A Record Year for Impairments***

The year 2003 was a record year both in terms of the number and dollar volume of defaults and impairments in the structured finance sector. A total of 183 securities had their first payment default in 2003. Forty securities were cured soon thereafter, while 143 remain uncured. A total of 46 securities were rated Ca or C but not in payment default. As a result, 189 securities became impaired in 2003. The total principal balance of these securities at the time of default was \$3.1 billion, and the total original balance of which was \$5.4 billion, representing roughly 0.5% of the total original balance of all structured finance securities outstanding at the beginning of 2003.

Figure 5 shows the counts of structured finance defaults in 2003 by sector. A list of materially impaired securities in 2003 is provided in the Appendix (Figure 30).

**Figure 5 – Distribution of Defaults and Impairments by Sector in 2003**

|   | Total  | ABS   | CMBS  | RMBS  |
|---|--------|-------|-------|-------|
| Cured Defaults  | 40     | 2     | 37    | 1     |
| Uncured Defaults                                      | 143    | 107   | 31    | 5     |
| Ca/C but not in default                               | 46     | 45    | 1     | 0     |
| Total Number of Defaults                              | 183    | 109   | 68    | 6     |
| Total Number of Impairments                           | 189    | 152   | 32    | 5     |
| Total Number of Securities                            | 11,386 | 5,473 | 2,443 | 3,470 |
| One-Year Default Rate (share of securities)           | 1.6%   | 2.0%  | 2.8%  | 0.2%  |
| One-Year Impairment Rate (share of securities)        | 1.7%   | 2.8%  | 1.3%  | 0.1%  |
| One-Year Impairment Rate (share of original balances) | 0.53%  | 0.63% | 0.45% | 0.03% |

Most impaired securities in 2003 were from the ABS and CMBS sectors. A total of 152 ABS securities became materially impaired in 2003 – about 2.8% of all ABS securities outstanding as of January 1, 2003. The dollar volume of impaired ABS securities was \$2.4 billion in 2003 as measured by balance at impairment, or about \$4.6 billion measured by original balance, equal to roughly 0.6% of the total original balance of all ABS securities outstanding on January 1, 2003.

In the CMBS sector, 32 securities were materially impaired in 2003, accounting for about 1.3% of all CMBS securities outstanding at the start of the year. The dollar amount of impaired securities was \$0.64 billion by balance at default, or about \$0.72 billion by original balance, equal to approximately 0.4% of the total original balance of all CMBS securities outstanding on January 1, 2003.

In the RMBS sector, only five securities were materially impaired in 2003, with a total amount of \$24 million by balance at default, equaling a total original amount of \$38 million, or about 0.03% of the total original balance of all RMBS securities outstanding on January 1, 2003.

12. Interest shortfalls in CMBS were the subject of a Moody's Structured Finance Special Report, "CMBS: Smoothing Recoveries of Servicer Advances to Minimize Interest Shortfalls," July 2003.

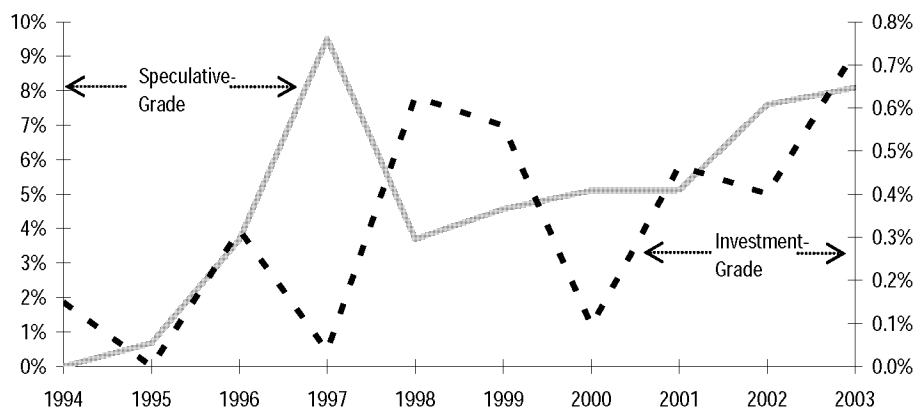
## Historical Impairment Rates

The following section reviews historical impairment rates for both short- and long- horizons and by rating categories. The goal is to study the trend of impairment rates from 1993 to 2003 and analyze the ability of Moody's ratings to accurately predict impairment rates.

### *One-Year Impairment Rates – Increased Markedly in 2003*

Figure 6 displays the time series of one-year impairment rates during 1993-2003 for the speculative- and investment-grade categories. The one-year impairment rate reported here is the number of newly impaired securities each year divided by the number of securities outstanding at the beginning of each year adjusted for withdrawals.<sup>13</sup>

**Figure 6 – Historical One-Year Impairment Rates**



As illustrated, both speculative-grade and investment-grade impairment rates increased in 2003. The investment-grade impairment rate, in particular, made a big jump.

The increase in the investment-grade impairment rate in 2003 was caused by the impairments of 39 tranches backed by manufactured housing loans, 12 CMBS tranches, nine tranches backed by HEL, five tranches backed by franchise loans, three tranches backed by credit card receivables, and two tranches backed by residential mortgages. Of these 70 impaired securities, 60, or 86%, were rated Baa at the beginning of 2003.

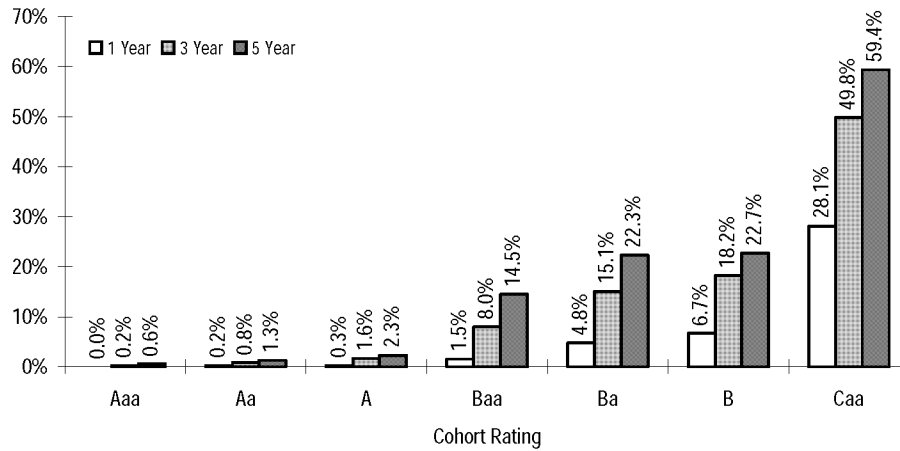
### *Multi-Year Impairment Rates – Corresponded Closely to Moody's Credit Ratings*

Moody's calculates multi-year cumulative impairment rates by computing marginal impairment rates each year and adjusting for rating withdrawals, using all data observations in the sample including some of the most recent vintages for the calculation of long-horizon impairment rates.<sup>14</sup> Figure 7 compares multi-year impairment rates in structured finance across rating categories and over the one-, three-, and five-year horizons. Detailed data on these impairment rates are shown in the Appendix (Figure 22).

13. To adjust for withdrawn ratings, we remove half the withdrawn ratings from the total outstanding securities at the beginning of each year.

14. This is the same approach used to calculate multi-year default rates in Moody's corporate issuer default studies. Marginal default rates for the full sample are estimated by taking a weighted average of marginal default rates, weighted by the number of securities in each cohort. This ensures that the default rates experienced by small cohorts do not have disproportionate weight in the calculation of the average. Marginal survival rates and cumulative survival rates are then calculated to derive cumulative default rates. This method also assumes that withdrawn securities in previous periods would have similar marginal default rates in remaining periods of a measured horizon as if they survived. Moody's believes that this method of calculating historical default rates is most likely to be predictive of the probability of default of similarly rated credits in the future. Other approaches such as the so-called "static pool" estimates that do not adjust for withdrawals will typically understate true default risk.

**Figure 7 – Multi-Year Impairment Rates by Rating, 1994-2003**



The results in Figure 7 demonstrate that Moody’s ratings have effectively rank-ordered credit risk across all time horizons. Within the speculative-grade rating range, the Caa rating category experienced much higher impairment rates than the Ba and B rating categories, whereas the impairment rates of the Ba-rated and B-rated securities were similar.

Within the investment-grade range, the Baa rating category experienced much higher impairment rates than the Aa and A rating categories, whereas the impairment rate of the A-rated securities was only modestly higher than that of the Aa-rated securities. In addition, the Baa impairment rate was only slightly lower than the Ba impairment rate.

As also suggested by Figure 7, increasing impairment rates are not “linear” with respect to the length of the rating horizon. In particular, the increase in impairment rates from the one-year horizon to the three-year horizon is much greater than the increase from the three-year horizon to the five-year horizon. This indicates that the marginal impairment rates of the cohorts’ second and third years are much greater than those in their fourth and fifth years.

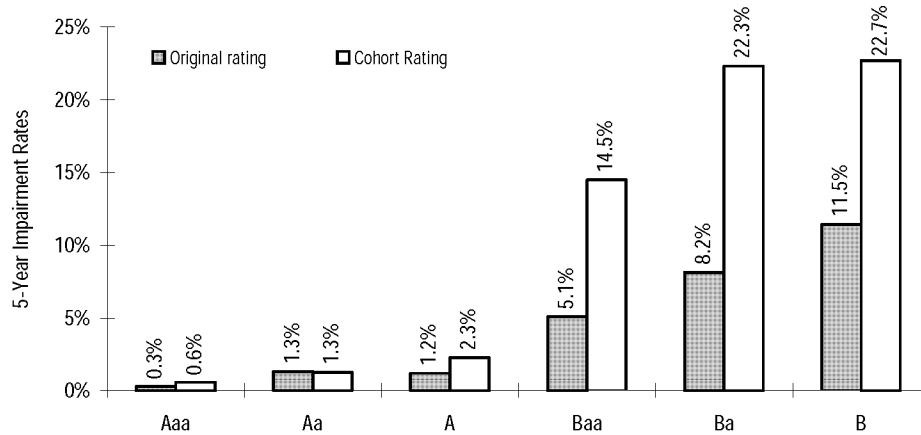
***Impairment Rates by Rating at Origination – Moderately Seasoned Securities Had Higher Impairment Rates***

Ratings at origination reflect Moody’s initial assessment of a security’s life-time expected loss rate. As time passes, that assessment may change, resulting in rating changes. As a result, a rating at any given cohort date (its cohort rating) may be different from the rating at origination (its original rating). Most of the analysis in this paper uses a cohort-based method that picks securities at the beginning of each year, groups them by their ratings, and tracks their default or loss experiences over a pre-specified horizon, but Moody’s also examines the default and loss rates of securities using only their original ratings.

An origination-based (or vintage-based) method groups securities by their original ratings and tracks their default or loss experiences over a pre-specified time horizon starting from the year in which they were originated (vintage year). The fundamental difference between the cohort method and the vintage method is that the members of a rating cohort will vary depending on which cohort date is picked given that their ratings may have changed, whereas the members of a vintage group do not change because they are grouped by their original rating, which is fixed. The method used to calculate cumulative impairment rates by original rating is the same as that used by cohort rating; we first calculate marginal impairment rates, make adjustments for ratings withdrawals, and then compute cumulative survival rates to derive cumulative impairment rates.

Figure 8 shows five-year impairment rates by original rating, compared with the five-year impairment rates by cohort rating. Detailed data on impairment rates by original rating over different time horizons appear in the Appendix (Figure 23).

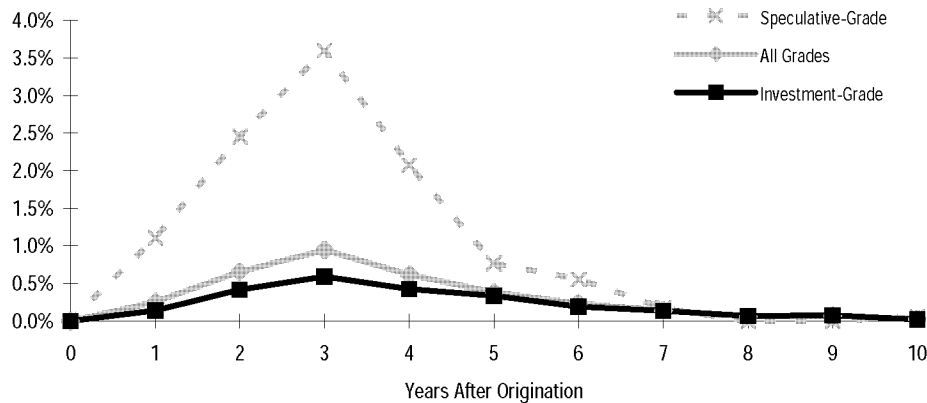
**Figure 8 – Comparing Cumulative Impairment Rates by Original and Cohort Rating, 1993-2003**



As illustrated in Figure 8, the five-year impairment rates by original rating are about half the rates by cohort rating, except for those in the Aa rating category, the five-year impairment rates of which are about the same. The results can be explained by the seasoning pattern of defaults in structured securities, as shown in Figure 9.

Figure 9 illustrates the seasoning pattern of one-year marginal impairment rates during 1993-2003.<sup>15</sup> This seasoning pattern of impairment rates was first documented in Moody's first structured finance default study published in December 2003. In that study, Moody's found that one-year marginal impairment rates rose in the first and second years after origination, peaked in the third year, and declined sharply thereafter.<sup>16</sup>

**Figure 9 – Average One-Year Marginal Impairment Rates by Years after Origination, 1993-2003**



As depicted in Figure 9, the seasoning pattern of impairment rates is significant not only for all securities in the aggregate, but also for the investment-grade and speculative-grade categories individually. Moderately seasoned securities have, therefore, experienced higher average impairment rates than similarly rated securities at issuance.<sup>17</sup>

15. One-year marginal impairment rate is the number of impairments in a given year divided by the number of outstanding securities at the beginning of that year. In particular, securities that were withdrawn and impaired in previous periods are considered no longer outstanding. The one-year marginal impairment rate by the number of years since origination is computed for vintage groups. For instance, all securities issued in 1998 are grouped together to form a 1998 vintage group and their default experiences are examined several years after origination. An average is then calculated for a given number of years after origination across all vintages.

16. Moody's structured finance rating transition study published in January 2003 also documented that ratings tend to sustain the highest one-year downgrade frequencies in the third or fourth year after origination. One-year downgrade frequencies are particularly low in the first year or in years seven or more after origination. Please refer to Moody's Special Comment, "Structured Finance Rating Transitions: 1983-2002, Comparisons with Corporate Ratings and Across Sectors," January 2003.

17. The average age of the 2003 rating cohorts is two and a half years.

## Loss Severity Rates Given Default

The second part of the loss rate calculation is loss severity rate given default (LGD). The latest LGD statistics are presented below using the methodology developed in Moody's recent Special Comment, "Measuring Loss Severity Rates of Defaulted Residential Mortgage-Backed Securities: A Methodology."<sup>18</sup> In addition, we describe how to compute multi-year average loss severity rates that can be used to calculate multi-year loss rates.

### *Final Loss Severity Rates – Strongly Correlated with Credit Ratings at Default and Origination*

After incorporating the default and loss experiences observed in 2003 into the sample of our study, the total number of matured uncured defaults in the RMBS/HEL sector increased to 117 and the number of non-matured uncured defaults increased to 118 for the period of 1993-2003.<sup>19</sup> Using these additional observations, we retested the model we developed in our prior study for predicting final loss severity on securities that are currently in default but have positive balances still outstanding. We found that this model continued to perform quite well with the latest data. We therefore decided to use that model to predict LGDs for non-matured impairments.<sup>20</sup>

Figure 10 presents the mean, median and standard deviation of the estimated final loss severity rates for the expanded data sample of 235 defaulted RMBS and HEL securities.

**Figure 10 – Estimated Final Loss Severity Rates by Rating for Defaulted RMBS/HEL Securities, 1988-2003**

| Rating at Default | % of Default-Date Balance |       |        |                    | Rating at Origination | % of Original Balance |       |        |                    |
|-------------------|---------------------------|-------|--------|--------------------|-----------------------|-----------------------|-------|--------|--------------------|
|                   | Counts                    | Mean  | Median | Standard Deviation |                       | Counts                | Mean  | Median | Standard Deviation |
| Aaa               | 1                         | 1.8%  | 1.8%   | na                 | Aaa                   | 12                    | 2.3%  | 2.7%   | 1.4%               |
| Aa                | 4                         | 2.9%  | 2.3%   | 2.9%               | Aa                    | 29                    | 7.2%  | 5.3%   | 6.7%               |
| A                 | 8                         | 24.0% | 13.1%  | 32.0%              | A                     | 16                    | 16.7% | 9.7%   | 20.6%              |
| Baa               | 39                        | 31.0% | 20.0%  | 30.7%              | Baa                   | 91                    | 35.2% | 36.4%  | 26.2%              |
| Ba                | 59                        | 45.2% | 39.1%  | 33.9%              | Ba                    | 42                    | 34.1% | 30.3%  | 26.5%              |
| B                 | 66                        | 58.8% | 58.7%  | 35.6%              | B                     | 45                    | 52.2% | 57.9%  | 27.4%              |
| Caa               | 40                        | 52.8% | 40.3%  | 36.7%              |                       |                       |       |        |                    |
| Ca/C              | 18                        | 68.3% | 76.0%  | 30.6%              |                       |                       |       |        |                    |
| Investment-Grade  | 52                        | 27.2% | 12.7%  | 30.3%              | Investment-Grade      | 148                   | 25.0% | 15.0%  | 25.5%              |
| Speculative-Grade | 183                       | 54.0% | 52.4%  | 35.4%              | Speculative-Grade     | 87                    | 43.4% | 42.1%  | 28.4%              |
| All               | 235                       | 48.1% | 42.9%  | 36.0%              | All                   | 235                   | 31.9% | 26.2%  | 28.0%              |

Note: Defaults are identified as of December 31, 2003; however, loss severity rate statistics are updated through April 2004.

Figure 10 indicates that both the mean and the median loss severity rates for RMBS and HEL securities differ substantially across rating categories. The data also suggests that, in addition to helping to predict default rates, ratings at default and at origination can provide a powerful rank-ordering of final severity rates.

The standard deviations of loss severity rates are fairly consistent across rating categories with the exception of the Aaa and Aa rating categories, which displayed much lower standard deviations than those of other rating categories. For securities rated A or below at the time of default, the standard deviations were mostly around 30-35%, whereas for securities rated A or below at the time of origination, the standard deviations were in the 20-30% range.

18. The loss severity rate of a defaulted security was defined to be the discounted present value of its life-time losses – both interest shortfalls and principal write-downs – using compounded coupon rates as discount rates. All losses are discounted to the default date (and expressed as a share of the default-date balance) or the origination date (and expressed as a share of the original balance) for that security. Later in this section, we also compute loss severity rates that are discounted to a cohort date and expressed as a share of the cohort-date principal balance.

19. Only defaulted and uncured securities are included in the study of LGD. Loss severity rates for all defaulted securities, including cured ones, would of course lead to lower estimates, particularly for investment-grade securities where cured defaults are most prevalent. We focus on examining LGD of uncured defaults and use them as proxies of loss given impairment. These LGDs are multiplied by cumulative impairment rates directly to yield loss rates.

20. Specifically, an additional 25 uncured defaults matured and their final losses are observed. For these defaults, Moody's examined the difference between their actual final loss given default (as a percent of original balance) and the predicted LGD (using the same blended model proposed in the methodology paper). In the blended model, time varying weights are placed on a static loss estimate, which is based on static factors such as tranche size and time from origination to default, and a dynamic loss estimate, which is based on dynamic factors such as cumulative loss to date as a share of cumulative principal balance reduced to date. The mean of the out-of-sample prediction errors is -0.68%, while the median is -0.82% and the standard deviation is 7.7%.

### Multi-Year Average Loss Severity Rates – Properly Rank-Ordered by Credit Rating

In order to compute multi-year cumulative loss rates, we need multi-year average loss severity rates by cohort rating that can be multiplied directly with multi-year impairment rates (discussed in the previous section) to yield multi-year loss rates (to be discussed in the next section).<sup>21</sup>

The concept of multi-year loss severity can best be explained by example. Suppose we know the average loss severity (as a percent of the cohort-date balance) of securities that were rated single-B two years before they defaulted and those rated single-B one year before they defaulted. We will call these loss severity values marginal loss severity rates. To calculate the average loss severity rates of the single-B rated securities that defaulted within two years (either in year 1 or year 2) one needs to take a weighted average of the one-year and the two-year marginal severity rates, where the weights are the shares of the two-year cumulative default rates attributable to year 1 and year 2.

Specifically, for securities defaulted in year 1, let the average marginal loss severity rate be  $LGD_1$ . For securities defaulted in year 2, let the average marginal loss severity rate be  $LGD_2$ . Let the incremental default rate in year 1 be  $dCDR_1$ , and let the incremental default rate in year 2 be  $dCDR_2$  so that  $dCDR_1 + dCDR_2 = CDR_2$ , where  $CDR_2$  is the two-year cumulative default rate. The average two-year loss severity rate is:

$$(LGD_1 * dCDR_1 + LGD_2 * dCDR_2) / CDR_2$$

Please note that the numerator in the above formula is effectively the two-year cumulative loss rate.<sup>22</sup> We repeated this procedure for various horizons and rating categories to create Figure 11.

**Figure 11 – Average Loss Severity Rates Over Multi-Year Horizons by Cohort Rating for Defaulted RMBS and HEL Securities, 1988-2003**

|                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year |
|-------------------|--------|--------|--------|--------|--------|
| Aaa               | 1.53%  | 8.92%  | 7.31%  | 5.58%  | 4.72%  |
| Aa                | 5.14%  | 8.51%  | 10.22% | 10.15% | 9.71%  |
| A                 | 34.04% | 30.03% | 24.55% | 22.40% | 20.91% |
| Baa               | 38.84% | 39.76% | 36.23% | 33.16% | 29.76% |
| Ba                | 40.83% | 36.49% | 33.80% | 32.11% | 30.14% |
| B                 | 47.90% | 50.70% | 50.28% | 48.50% | 46.99% |
| Caa               | 64.59% | 58.75% | 56.54% | 53.51% | 53.51% |
| Investment-Grade  | 34.68% | 35.11% | 30.60% | 26.97% | 24.04% |
| Speculative-Grade | 48.03% | 44.58% | 42.33% | 40.24% | 38.02% |
| All               | 43.71% | 40.65% | 36.59% | 33.14% | 30.21% |

*Note: Multi-year average loss severity rates are expressed as a percentage of principal balance at cohort date. The loss severity rates in this Figure are multiplied by multi-year impairment rates to yield multi-year loss rates.*

There are two notable observations that can be drawn from Figure 11.

First, loss severity rates for Aaa- or Aa-rated securities at the beginning of any given year (their cohort rating) are much lower than the severity rates of other rating categories. The loss severity rates for B- or Caa-rated securities are much higher. Generally, there is a sizable difference in the multi-year loss severity rates between the investment-grade and speculative-grade categories. The difference is, on average, about 10 to 15 percentage points.

Second, in general, average loss severity rates decline with the horizon. This result was to be expected, because typically there are payments made between cohort formation dates and default dates. These payments result in lower severity rates for longer horizons than for short horizons because, as a share of cohort-date principal balance, the loss severity rate of a default occurring in the distant future of the cohort date is lower than a default occurring shortly after the cohort date.<sup>23</sup>

21. Loss severity rates by rating at default, rating at origination or rating at a cohort date cannot be directly multiplied by cumulative impairment rates because these severity rates are uniquely defined with regard to a specific date. The multi-year average loss severity rate concept takes into account the uncertainty associated with the timing of default over a measured time horizon. The concept was first developed in Moody's corporate bond default research – and called there "holding period" recovery rates – in a Moody's Special Comment entitled, "Recovery Rates on Defaulted Corporate Bonds and Preferred Stocks, 1982-2003," which was published in December 2003. The multi-year average loss severity rate used in structured finance and analyzed in this paper differs slightly from its corporate finance analogue to take into account the amortization of principal and the importance of discounting in structured securities.

22. This approach has the advantage to allow the default rate and severity rate to be calculated separately and then multiplied together to obtain loss rate. The separation is necessary because for securities that became impaired because they were rated Ca or C but were not yet in default, their loss severity rates are not known. Under the circumstances where we know the loss severity rates for all defaulted securities, this method is equivalent to taking the weighted average of the loss severity rates of all defaulted securities within a given time horizon, regardless of which year the default event has occurred.

## Multi-Year Cumulative Loss Rates

Once one has obtained the multi-year cumulative impairment rates and multi-year average loss severity rates given default, calculating the multi-year cumulative loss rates is straightforward. For instance, the average three-year loss rate is simply the product of the average three-year cumulative impairment rate and the average three-year loss severity rate. The following section reports historical average multi-year loss rates and compares them to Moody's idealized loss rates.

### *Loss Rates by Cohort Rating – Higher Rated Securities Sustained Lower Losses*

Figure 12 shows average multi-year loss rates as a product of the multi-year cumulative impairment rates of all structured securities and the multi-year average loss severity rates for RMBS and HEL securities. This method of calculation implicitly assumes that the loss severity rates by rating category and horizon observed in the RMBS and HEL classes apply to other structured classes as well.<sup>24</sup>

**Figure 12 – Estimated Average Multi-Year Cumulative Loss Rates by Cohort Rating, 1994-2003**

|                   | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 |
|-------------------|--------|--------|--------|--------|--------|
| Aaa               | 0.00%  | 0.01%  | 0.02%  | 0.02%  | 0.03%  |
| Aa                | 0.01%  | 0.04%  | 0.08%  | 0.11%  | 0.12%  |
| A                 | 0.09%  | 0.29%  | 0.41%  | 0.46%  | 0.48%  |
| Baa               | 0.60%  | 1.70%  | 2.88%  | 3.65%  | 4.07%  |
| Ba                | 1.95%  | 3.94%  | 5.16%  | 6.25%  | 6.72%  |
| B                 | 3.22%  | 6.45%  | 9.15%  | 10.22% | 10.55% |
| Caa               | 18.15% | 21.04% | 23.21% | 25.10% | 25.10% |
| Investment-Grade  | 0.15%  | 0.43%  | 0.71%  | 0.87%  | 0.95%  |
| Speculative-Grade | 2.97%  | 5.49%  | 7.28%  | 8.44%  | 8.85%  |
| All Grades        | 0.49%  | 1.03%  | 1.49%  | 1.76%  | 1.89%  |

*Note: All US ABS, CMBS and RMBS asset classes included. We assume losses severity rates of impaired securities by rating in the CMBS and non-HEL ABS sectors are the same as those in the RMBS and HEL sectors.*

As shown, Moody's ratings strongly differentiate average multi-year loss rates on a cohort basis: lower ratings imply higher multi-year loss rates.

### *Loss Rates by Original Rating – Differences Explained by Seasoning*

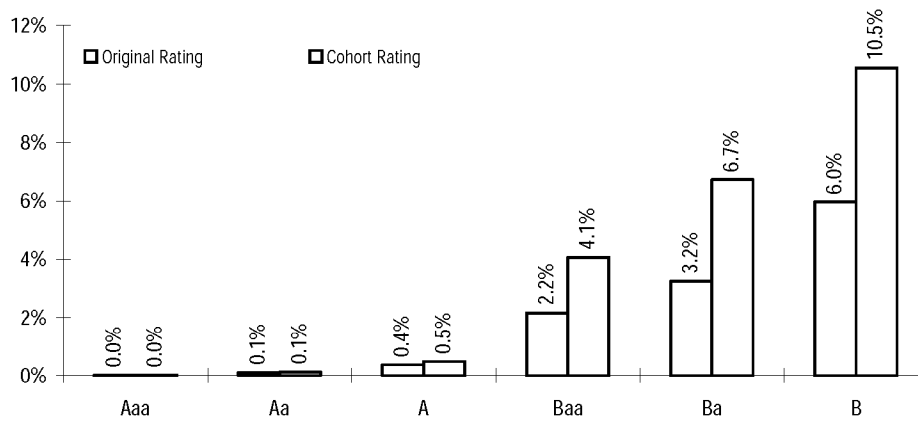
As shown in earlier sections of this report, both the multi-year impairment rates and the multi-year loss severity rates are lower based on original rating than based on cohort rating. Consequently, multi-year loss rates based on original ratings are lower than those based on cohort ratings (Figure 13).

Cumulative loss rates by original rating are calculated using the same method as that used to calculate cumulative loss rates by cohort rating – multiplying multi-year impairment rates by original rating against multi-year average loss severity rates by original rating. The multi-year loss severity rates are computed in the same way as the cohort-rating based severity rates. Detailed data on loss rates by rating and horizon are provided in the Appendix (Figure 24 and Figure 25).

23. The declines in multi-year average loss severity rates across horizons are not as significant as those of marginal loss severity rates. This is because a multi-year average loss severity rate is a weighted average of marginal loss severity rates, weighted by their corresponding incremental default rates. A multi-year average loss severity rates depend on default rates, whereas a marginal loss severity rate does not.

24. Some ABS material impairments – those rated Ca or C but that have not yet experienced outright payment defaults or lack payment information – e.g. the Heilig Meyers and NPF healthcare receivable transactions – may sustain higher average loss severity rates by rating than similarly rated issues studied in the RMBS and HEL sectors. Many CMBS material impairments, which have sustained only unpaid interest shortfalls, however, appear likely to experience lower average loss severity rates by rating than those observed in the RMBS and HEL sectors. Overall, the average LGD rates by rating in the structured finance sector as a whole are likely to be similar to those observed in the RMBS and HEL sectors.

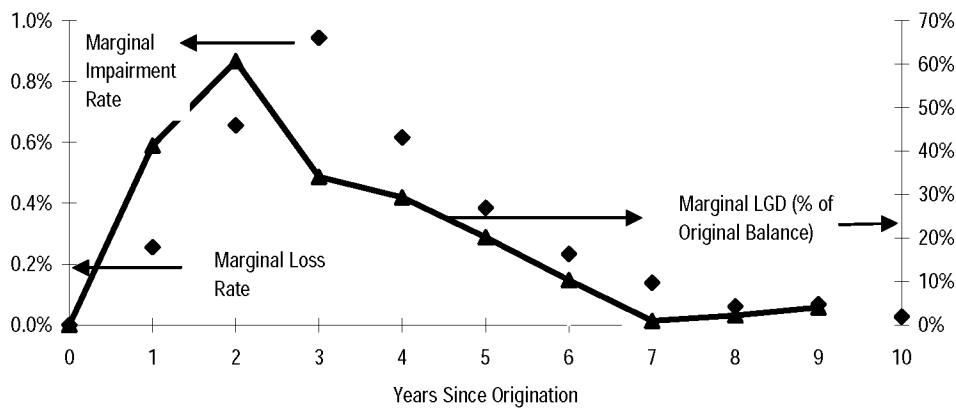
**Figure 13 – Estimated Average Five-Year Cumulative Loss Rates by Original and Cohort Rating, 1993-2003**



As shown in Figure 13, five-year loss rates as a percentage of original balance are correlated with original ratings, and are, on average, lower than the five-year loss rates expressed as a percentage of cohort-date principal balance. The difference in loss rates is greater for the Baa or lower rating categories than it is for ratings of single-A or higher.

Similar to the difference in the multi-year impairment rates, the difference in the multi-year loss rates is explained by the seasoning pattern – loss rates tend to rise in early years and gradually decline after they peak in the second year following origination (Figure 14).<sup>25</sup>

**Figure 14 – Seasoning Patterns of Average One-Year Marginal Impairment Rate, Loss-Given-Default Rate and Loss Rate, 1993-2003**



Note: loss rate is measured as a percentage of original balance.

Figure 14 shows one-year marginal impairment rates, marginal loss severity rates given default, and marginal loss rates for different years since origination for securities of all ratings.

The seasoning pattern is evident in all three series. The peak of the marginal impairment rates appears in the third year, while the peak of the marginal LGD appears in the second year. As a result, one-year marginal loss rates peak in the second year after origination, gradually decline afterwards, and move close to zero six years after origination.

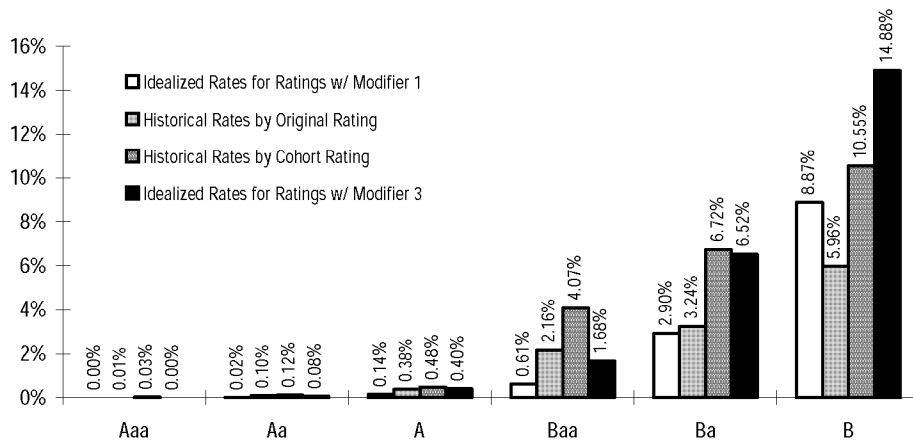
25. This seasoning pattern in marginal impairment rates represents an average across all US ABS, CMBS, and RMBS securities. The seasoning pattern in some asset classes may be more significant (e.g. mortgage-backed securities and auto-loan-backed securities) than in others (e.g. securities backed by credit card receivables). The seasoning pattern in marginal loss-given-default rates represents that of residential mortgage-backed securities and securities backed by HELs.



### Comparisons with Idealized Loss Rates – Historical Loss Rates Tracked Idealized Rates

Figure 15 illustrates the similarities and differences between historical average loss rates and idealized loss rates. The idealized rates for ratings with modifier 1 (Aa1, A1, Baa1, etc.) are the lower bounds of the idealized loss rates of each broad rating category. The idealized rates for ratings with modifier 3 (Aa3, A3, Baa3, etc.) are the upper bounds. Historical average loss rates are grouped by broad rating categories. Moody's idealized loss rate table is provided in the Appendix (Figure 27).

**Figure 15 – Estimated Historical Average Five-Year Loss Rates in Structured Finance (1993-2003) with Comparisons to the Idealized Loss Rates**



Two results are particularly interesting.

First, historical average realized loss rates have been similar to the idealized loss rates for securities rated Aaa, Aa and A.<sup>26</sup> For securities rated Baa, historical average loss rates have been higher than the Baa idealized loss rates on a vintage basis (by original rating), and substantially higher on a cohort basis (by cohort rating). For example, by cohort rating, the Baa five-year loss rates averaged about 4.1%, much higher than the idealized five-year loss rate of 1.7% for Baa3.

Second, in the speculative-grade category and on the basis of cohort rating, the average five-year loss rate of a Ba security was similar to the idealized loss rate of Ba3, and the average five-year loss rate of a B security was between the idealized loss rates of B1 and B3.

By original rating, the average five-year loss rate of a Ba security was similar to the idealized loss rate of Ba1, and the average five-year loss rate of a B security was somewhat lower than the idealized loss rate of B1.

Overall, historical loss rates by original rating (except for the B rating category) have tracked idealized loss rates better than have those by cohort rating.

## Structured Finance Ratings Performance

In April 2003, Moody's published a *Special Comment* on measuring the performance of corporate bond ratings.<sup>27</sup> In that paper, Moody's proposed several metrics that could be used to gauge rating accuracy and rating stability. The rating accuracy metrics Moody's proposed included cumulative accuracy profiles (CAP), accuracy ratios (AR), investment-grade default rates, and average rating prior to default. The rating stability metrics proposed by Moody's included the frequency of large rating changes and the frequency of rating reversals. Since then, Moody's has published corporate rating quality metrics on a quarterly basis.<sup>28</sup>

The corporate rating performance metrics mentioned above can also be used to measure the performance of Moody's structured finance ratings. However, because Moody's structured finance ratings specifically emphasize expected loss rates, any rating quality metrics used to monitor structured finance ratings need to incorporate loss severity given default. As was shown earlier in this study, loss given default has been correlated with rating.

26. The idealized loss rate for the Aaa rating category is not zero. Please see Appendix for the idealized loss rate table.

27. "Measuring The Performance of Corporate Bond Ratings," Moody's Special Comment, April 2003

28. See for example, "The Performance of Moody's Corporate Bond Ratings: January 2004 Quarterly Update," Moody's Special Comment, January 2004.

### ***CAP Curves and Accuracy Ratios Adjusted for LGD – Measures of Relative Rating Accuracy***

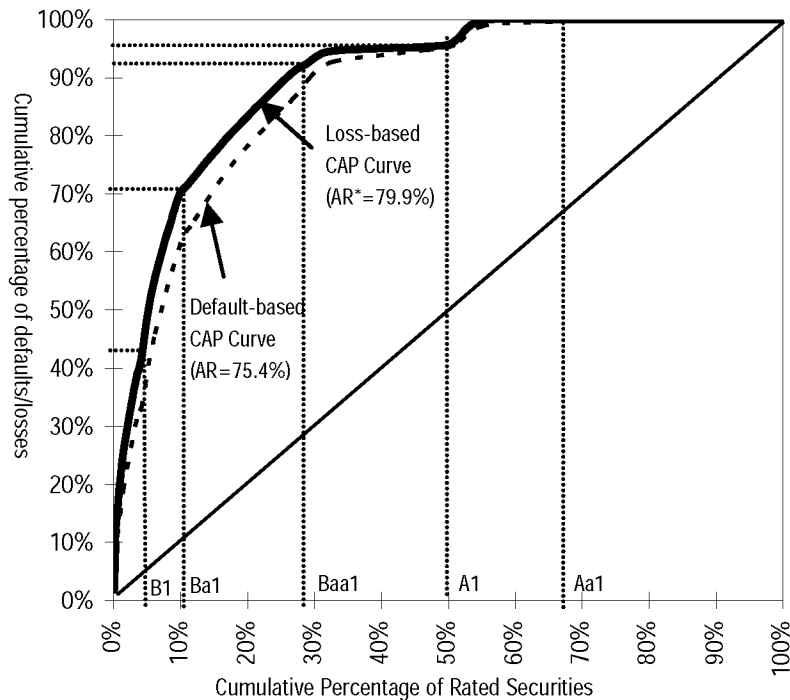
Moody's proposes two new metrics for relative rating accuracy in structured finance: a loss-based CAP curve and a loss-based accuracy ratio. Both metrics are simple extensions of the default-based cumulative accuracy profiles (CAP) curve and the default-based accuracy ratios (AR) used as corporate rating quality metrics.

Specifically, a loss-based CAP curve plots, for each rating category, the proportion of losses accounted for by securities with the same or lower rating against the proportion of all securities with the same or lower rating. Intuitively, a loss-based CAP curve is very much like a default-based CAP curve except that it treats a default with a 50% loss severity rate as a half default, and a default with 0% loss severity rate as a non-default.

A loss-based accuracy ratio calculates the ratio of the area between the loss-based CAP curve and the 45-degree line to the maximum possible area above the 45-degree line.

These concepts are illustrated in Figure 16, where the horizontal axis shows the cumulative percentage of all securities rank-ordered by their credit ratings from left to right, and the vertical axis shows the cumulative percentage of defaulters rank-ordered by their credit ratings from bottom to top. For example, securities rated Baa1 or below at the beginning of a cohort year accounted for 30% of the entire population of securities in the data sample, but accounted for 90% of all defaulted securities.

**Figure 16 – Default-Based and Loss-Based One-Year CAP Curves and Accuracy Ratios for Cohort Ratings, 1993-2003**



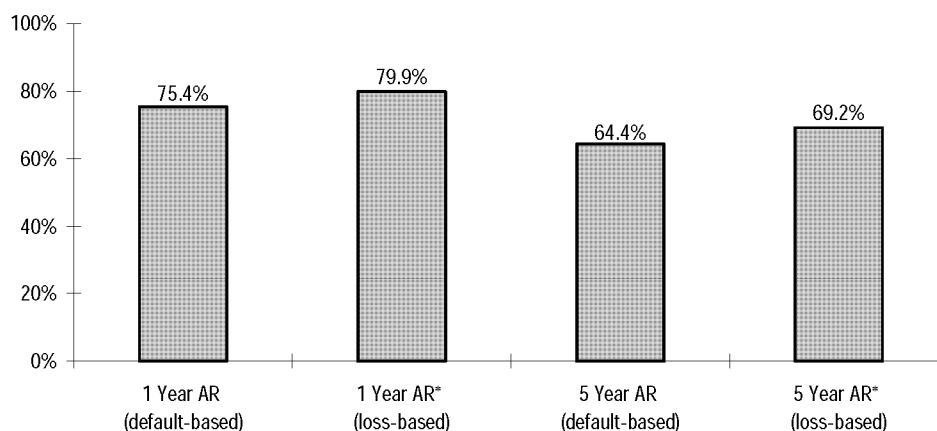
As illustrated, the default-based CAP curve is located underneath the loss-based CAP curve, suggesting there is an improvement of rating accuracy after the loss severity rate given default is taken into account.<sup>29</sup> The improvement is also manifested by a positive differential between the AR (the default-based accuracy ratio averaged about 75.4%) and the AR\* (the loss-based accuracy ratio averaged about 79.9%).<sup>30</sup>

29. The closer the CAP curve is to the upper left of the square box, the more accurate ratings are (AR closer to 1). A CAP curve close to the 45-degree line implies that ratings are randomly assigned (AR closer to 0).

30. To construct CAP curves and compute average accuracy ratios, we form rolling annual cohorts at the beginning of each month. These overlapping annual cohorts are different from the annual cohorts we used to study the impairment rates and loss rates, which were formed at the beginning of each year and were non-overlapping. The goal here is to utilize the data as much as possible (thus obtain more granularity) for the purpose of tracking ratings performance. This is the method adopted for calculating corporate rating performance metrics, and will be the standard method for all structured rating performance metrics.

The CAP curves can also be plotted, or their accuracy ratios calculated for longer horizons. In general, accuracy ratios are lower for long time horizons than for short time horizons. Figure 17 compares the one-year and five-year accuracy ratios of the ratings on structured finance securities.

**Figure 17 – One-Year and Five-Year Accuracy Ratios<sup>31</sup>**



As displayed in Figure 17, the overall loss-based accuracy ratio has been high both on a one-year (about 80%) and a five-year horizon (about 69%). In addition, the loss-based accuracy ratio clearly improves upon the default-based accuracy ratio. Comparisons of accuracy ratios in the structured and corporate sectors will be presented in the next section.

### ***Investment-Grade Loss Rate and Average Rating Prior to Impairment – Measures of Absolute Rating Accuracy***

As a measure of a rating system’s absolute predictive power, the investment-grade default rate is the percentage of securities rated investment-grade at the beginning of a cohort year that have subsequently defaulted within the cohort horizon. Because Moody’s structured finance ratings focus particularly on expected loss rates, it is more important to analyze the investment-grade loss rate, which is the average loss rate for securities rated investment-grade at the beginning of a cohort year.

Using rolling annual cohorts formed on a monthly frequency, we found that the one-year investment-grade default rate from 1994 to 2003 was 0.42% and the one-year investment-grade loss rate was 0.16%. In comparison, the one-year investment-grade default rate and loss rate in the corporate sector over 1983-2003 were 0.10% and 0.05%, respectively, both of which were lower than those in structured finance.

Another metric used to gauge corporate ratings’ performance is the average rating during a 36-month-period prior to default.<sup>32</sup> We found the average rating prior to impairment was Ba1 in structured, three notches above the average rating of approximately B1/B2 in corporate. However, again it should be recognized that loss given default tends to be lower in structured overall compared to corporate finance.

### ***Frequencies of Rating Changes and Rating Reversals – Measures of Rating Stability***

Frequencies of rating changes and rating reversals are measures of rating stability. Moody’s rating transition studies for structured finance have demonstrated that structured finance ratings, overall, have been more stable than corporate ratings. When ratings do change, however, the magnitude of rating changes tends to be larger in structured than in corporate.<sup>33</sup> As a result, the frequency of rating actions was substantially lower in structured (about 7.5%) than in cor-

31. AR\* is the loss-based accuracy ratio and AR is the default-based accuracy ratio. For the 1-Year AR in the structured sector, the historical average is based on monthly cohorts formed from February 1, 1993 to January 1, 2003. For the 5-Year AR in the structured sector, the historical average is based on monthly cohorts formed from February 1, 1993 to January 1, 1999. We assume the final loss severity rates by rating on defaulted CMBS and non-HEL securities are the same as those on RMBS and HEL securities.

32. This metric was proposed for corporate ratings performance. To calculate this metric, the rating of the defaulted security is measured every month for 36 months prior to default as well as immediately prior to default. These 36 rating measurements are averaged together to create a single representative number for each defaulted security. These representative numbers are averaged together to create the reported average rating.

33. Please refer to Moody’s Special Comment, “Structured Finance Rating Transitions: 1983-2003,” February 2004. In a recent Special Comment, Moody’s also demonstrated that watchlist directions are strong indicators of future rating change directions and the majority of structured finance rating downgrades were preceded by negative reviews. Please see Moody’s Special Comment, “Structured Finance Watchlist Resolutions: 1992-2003,” June 2004.

porate (about 25.3%) over 1983-2003, but the frequency of large rating actions (rating changes with a magnitude of three or more notches over one year) as a share of all rating changes was much higher in structured (about 49% of all rating changes) than in corporate (about 15% of all rating changes).

Additionally, rating reversals in structured have been rare. The rating reversal rate – the number of securities the ratings of which were reversed (a downgrade was followed by an upgrade, or vice versa) within one year as a share of the outstanding securities at the beginning of a year – was a mere 0.2% during the period under study, and was largely caused by rating reversals in 2000 on securities from Green Tree/Conseco transactions. The ratings on these transactions were reversed because they were directly linked to the corporate rating of Conseco, which was upgraded in December 1999 from Ba1 to Baa3 but then downgraded back to Ba1 in April 2000. In comparison, the rating reversal rate in corporate finance was roughly 0.6%.

## Comparisons between Structured and Corporate Ratings

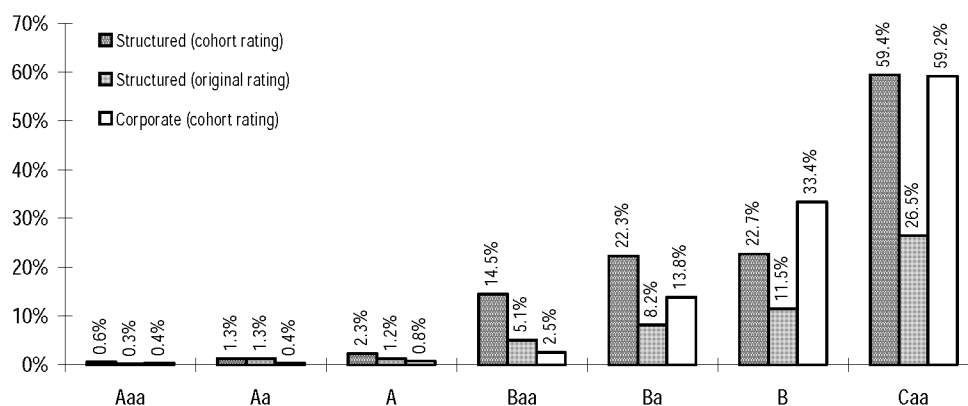
Moody's corporate default rate, recovery rate, and rating performance studies demonstrate that Moody's ratings have been effective in discerning relative corporate credit risks.<sup>34</sup> The findings presented in this study for structured finance ratings, in particular, show that Moody's has been capable of differentiating relative credit risk in structured finance.

This last section investigates the similarities and differences in historical default rates, loss rates and accuracy ratios between the corporate and structured sectors.

### Default and Impairment Rates – Impairment Rates by Cohort Rating Generally Higher in Structured

Figure 18 compares the default rates in the corporate sector and the impairment rates in the structured sector.<sup>35</sup> Detailed US corporate default rate data is shown in the Appendix (Figure 26). It reveals that, by cohort rating, five-year default rates of investment-grade ratings in the corporate sector have been lower than the five-year impairment rates for the structured sector. The difference is particularly significant for securities rated Baa. Five-year default and impairment rates for speculative-grade cohort ratings have generally been similar.

**Figure 18 – Five-Year Impairment and Default Rates in Structured and Corporate**



\*Note: For structured, the data sample is US ABS, CMBS, & RMBS during 1993-2003; for corporate, the data sample is US corporate during 1983-2003.

By original rating, however, the impairment rates of investment-grade ratings have been similar to corporate, while the impairment rates of speculative-grade ratings have been much lower in structured than in corporate.<sup>36</sup>

Comparisons between the two sectors, however, should be drawn with caution. Structured finance securities are predominantly rated investment grade – with about 87% of the outstanding securities in the sample rated investment

34. Moody's publishes an annual corporate default and recovery rate study as well as monthly and quarterly updates. Moody's most recent annual corporate default study was published in January 2004. Please refer to Moody's Special Comment, "Default & Recovery Rates of Corporate Bond Issuers, A Statistical Review of Moody's Ratings Performance, 1920-2003."

35. The concept of default in the corporate sector bears more similarity to the concept of material impairment than to that of payment default in the structured sector. Despite their similarities, the comparisons between corporate default rates and structured impairment rates are only indicative and are not meant to be exact.

36. Moody's has not published corporate default rates by rating at origination. Preliminary research findings indicate there is also a seasoning pattern of marginal default rates in the corporate sector, but is not as pronounced as that found in the structured sector. As a result, the differences between the default rates based on cohort rating and those based on original rating are small in the corporate sector, especially for investment-grade rating categories.

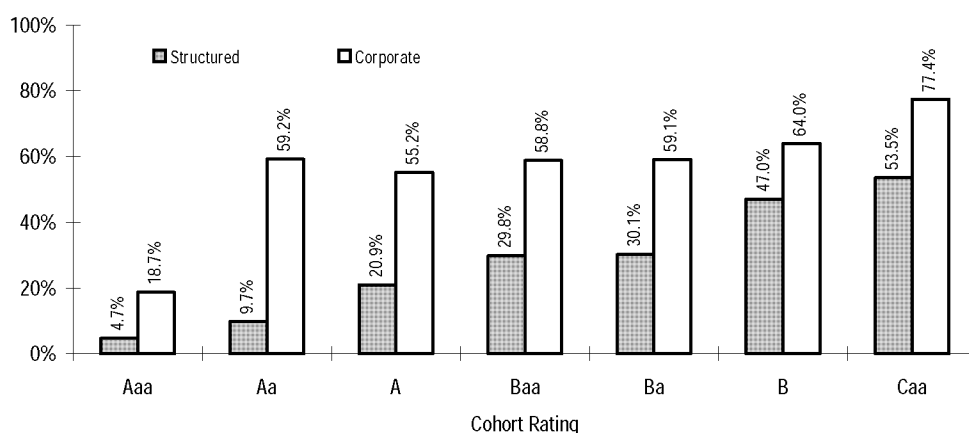
grade at the end of 2003 and about 90% rated investment grade at origination. By contrast, less than 60% of the outstanding corporate issuers are rated investment grade.

In addition, the causes and results of default are different in the corporate and the structured sectors. Structured securities are issued by special-purpose-entities (SPE) that are bankruptcy-remote. A structured security's default can be caused by a simple disruption of cash flow such as missing an interest payment, and does not typically lead to a bankruptcy, whereas the default of a corporate issuer is often associated with bankruptcy. This is because a SPE is typically an entity that passes through cash flows and does not typically intervene in the cash flow distribution. By contrast, the management of a company will often do all it can to avoid a default or a disruption of payments. As a result, default events are more likely to occur in structured finance than in corporate finance. And for the same reason, loss expectation is generally lower on a defaulted security in structured finance than they are in corporate finance, all else being equal.

**Loss-Given-Default – Markedly Lower and Better Ordered by Rating in Structured**

Figure 19 compares average five-year LGD in the corporate and structured sectors.<sup>37</sup>

**Figure 19 – Average Loss-Given-Default Rates over a Five-Year Time Horizon**

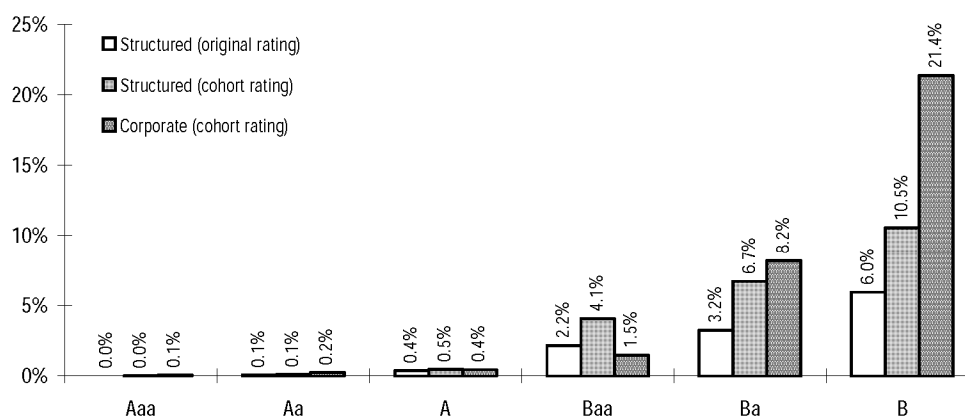


Note: For structured, the data sample is US RMBS & HEL during 1988-2004(April); for corporate, the data sample is US corporate during 1983-2003.

**Realized Loss Rates – Similar for Ratings A or Above, Higher for Baa, Lower for Ba or Below in Structured**

Figure 20 compares average five-year loss rates in the structured and corporate sectors. Detailed US corporate loss rate data appear in the Appendix (Figure 26).

**Figure 20 – Historical Average Five-Year Cumulative Loss Rates**



Note: For structured, the data sample is US ABS, CMBS, & RMBS during 1993-2003; for corporate, the data sample is US corporate during 1983-2003.

37. Five-year LGDs in corporate are from Moody's corporate recovery rates study. Five-year LGDs in structured are based on loss experiences in the RMBS and HEL sectors.

Historically, average five-year loss rates in the structured and corporate sectors are similar for securities rated Aaa, Aa and A. The Aaa five-year historical loss rate is 0.01% by original rating in structured, 0.03% by cohort rating in structured, 0.03% by cohort rating in corporate.

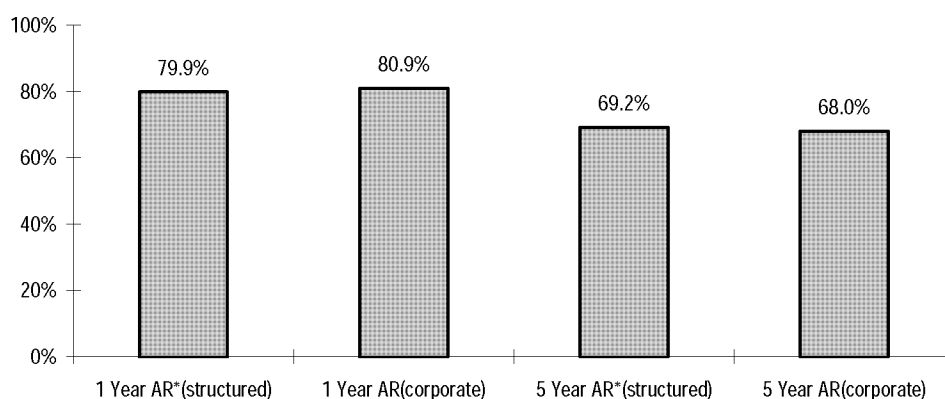
Baa-rated structured finance securities, however, have sustained higher loss rates than similarly rated corporate securities. This becomes especially apparent when the loss rates are measured against cohort ratings.

Structured finance securities rated Ba and B have sustained lower loss rates than corporate securities rated Ba and B. By cohort rating, the five-year loss rates for securities rated Ba have been similar across both sectors, but for structured securities rated B, the loss rate is less than half that for similarly rated corporate securities.

**Accuracy Ratios – Similar in Structured and Corporate**

Ideally, the comparison of accuracy ratios in the two sectors should be based on their loss experiences, that is, based on loss-based accuracy ratios. Because corporate default rates are typically based on issuers rather than issues, but corporate loss-given-default is based on issues, the loss-based accuracy ratio for the corporate sector is not immediately available. Because LGDs in the corporate sector have not been as strongly rank-ordered as have those in the structured sector (Figure 19), we believe the difference between using a loss-based accuracy ratio relative and a default-based ratio in corporate will be minimal. As a result, it is not inaccurate to directly compare the loss-based accuracy ratio in structured with the default-based accuracy ratio in corporate (Figure 21).

**Figure 21 – One- and Five-Year Accuracy Ratios in Structured and Corporate**



*Note: For structured, the data sample is US ABS, CMBS, & RMBS during 1993-2003; for corporate, the data sample is US corporate during 1983-2003.*

As illustrated in Figure 21, both the one-year and the five-year accuracy ratios are very similar in the two sectors.

Finally, we note that the comparisons between structured finance ratings and corporate finance ratings presented in this section are based on limited data samples and simple statistical measures such as weighted averages. In addition, Moody’s default and loss study for structured securities only incorporates data back to 1993, which encompasses only one complete corporate credit cycle and only the expansion phase of the US real estate cycle. This study has used the US corporate default and loss experience during 1983-2003 as a benchmark for comparison. There is no single “best” benchmark, however, for comparing the performance of structured finance ratings.

## Concluding Remarks

---

Over the past two years, Moody's has published statistical findings on rating transition frequencies, default and impairment rates, and loss severity rates given default in structured finance. This *Special Comment* is a direct result of this sequence of structured finance rating performance research. While the study does not include CDO securities or international structured securities, Moody's believes the findings documented in this *Special Comment* are good representations of the rating performance of the structured finance sector as a whole. We hope to extend our analysis in the future to the sectors not covered here.

Overall, Moody's finds that its structured finance ratings have provided strong rank-ordering of default frequencies, loss severity rates and, consequently, the average realized loss rates. The accuracy ratios in structured finance have been high and are generally similar to those in corporate finance.

We note that historical experience is merely a representation of what has happened over a given time period. The changing economic environment, the maturing of more transactions, the introduction of new assets and new structures are just a few of the many possible reasons why future performance may not be the same as past performance.

Moody's will continue to update these studies on a regular basis, with the possible inclusions of default and loss experiences in the CDO sector, and ultimate loss severity rates for defaulted securities in asset classes other than RMBS and HEL.

## Appendix

**Figure 22 – Multi-Year Cumulative Impairment Rates by Sector and by Cohort Rating, 1994-2003**

| <b>US ABS, CMBS &amp; RMBS</b> | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-Year</b> |
|--------------------------------|---------------|---------------|---------------|---------------|---------------|
| Aaa                            | 0.01%         | 0.09%         | 0.24%         | 0.42%         | 0.58%         |
| Aa                             | 0.23%         | 0.47%         | 0.82%         | 1.15%         | 1.30%         |
| A                              | 0.27%         | 0.95%         | 1.65%         | 2.05%         | 2.30%         |
| Baa                            | 1.55%         | 4.28%         | 8.02%         | 11.04%        | 14.49%        |
| Ba                             | 4.79%         | 10.78%        | 15.10%        | 19.72%        | 22.30%        |
| B                              | 6.71%         | 12.73%        | 18.21%        | 21.12%        | 22.68%        |
| Caa                            | 28.10%        | 39.92%        | 49.81%        | 59.37%        | 59.37%        |
| Investment-Grade               | 0.44%         | 1.24%         | 2.32%         | 3.20%         | 4.12%         |
| Speculative-Grade              | 6.19%         | 12.32%        | 17.15%        | 21.27%        | 23.49%        |
| All                            | 1.11%         | 2.54%         | 4.06%         | 5.34%         | 6.42%         |
| <b>US ABS (incl. HEL)</b>      | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-Year</b> |
| Aaa                            | 0.00%         | 0.03%         | 0.14%         | 0.22%         | 0.36%         |
| Aa                             | 0.54%         | 1.12%         | 1.92%         | 2.64%         | 3.15%         |
| A                              | 0.32%         | 1.14%         | 2.05%         | 2.69%         | 3.03%         |
| Baa                            | 2.49%         | 7.10%         | 14.32%        | 20.78%        | 29.68%        |
| Ba                             | 12.62%        | 28.83%        | 39.67%        | 54.25%        | 62.24%        |
| B                              | 24.17%        | 40.19%        | 49.60%        | 54.44%        | 55.96%        |
| Caa                            | 49.65%        | 94.41%        | na            | na            | na            |
| Investment-Grade               | 0.61%         | 1.74%         | 3.44%         | 5.00%         | 7.07%         |
| Speculative-Grade              | 16.90%        | 33.06%        | 43.32%        | 55.48%        | 61.95%        |
| All                            | 1.54%         | 3.55%         | 5.79%         | 8.08%         | 10.50%        |
| <b>US CMBS</b>                 | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-Year</b> |
| Aaa                            | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| Aa                             | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| A                              | 0.14%         | 0.56%         | 1.23%         | 1.52%         | 2.05%         |
| Baa                            | 0.61%         | 1.63%         | 2.10%         | 2.50%         | 2.86%         |
| Ba                             | 0.96%         | 1.87%         | 3.13%         | 4.02%         | 4.02%         |
| B                              | 3.68%         | 8.45%         | 15.01%        | 19.27%        | 22.56%        |
| Caa                            | 8.22%         | 20.32%        | 38.36%        | 55.17%        | 55.17%        |
| Investment-Grade               | 0.25%         | 0.71%         | 1.04%         | 1.24%         | 1.50%         |
| Speculative-Grade              | 2.47%         | 5.61%         | 10.09%        | 13.24%        | 14.95%        |
| All                            | 0.83%         | 1.96%         | 3.34%         | 4.26%         | 4.85%         |
| <b>US RMBS</b>                 | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-Year</b> |
| Aaa                            | 0.02%         | 0.16%         | 0.40%         | 0.68%         | 0.87%         |
| Aa                             | 0.05%         | 0.11%         | 0.29%         | 0.50%         | 0.56%         |
| A                              | 0.23%         | 0.71%         | 1.01%         | 1.09%         | 1.18%         |
| Baa                            | 1.09%         | 2.87%         | 4.92%         | 6.28%         | 7.24%         |
| Ba                             | 2.47%         | 5.23%         | 7.40%         | 8.75%         | 9.87%         |
| B                              | 4.80%         | 8.87%         | 12.35%        | 14.02%        | 14.96%        |
| Caa                            | 26.32%        | 32.72%        | 36.93%        | 43.24%        | 43.24%        |
| Investment-Grade               | 0.28%         | 0.79%         | 1.41%         | 1.88%         | 2.18%         |
| Speculative-Grade              | 3.63%         | 6.88%         | 9.50%         | 11.01%        | 12.06%        |
| All                            | 0.72%         | 1.59%         | 2.48%         | 3.09%         | 3.49%         |



| <b>US ABS (excl. Manufactured Housing)</b> | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-Year</b> |
|--|---------------|---------------|---------------|---------------|---------------|
| Aaa  | 0.00%         | 0.04%         | 0.15%         | 0.24%         | 0.41%         |
| Aa   | 0.47%         | 0.99%         | 1.39%         | 1.56%         | 1.89%         |
| A  | 0.19%         | 0.66%         | 1.27%         | 1.83%         | 2.10%         |
| Baa  | 1.35%         | 3.58%         | 6.70%         | 10.30%        | 13.40%        |
| Ba   | 5.50%         | 16.20%        | 25.44%        | 31.12%        | 39.50%        |
| B  | 17.45%        | 31.35%        | 41.49%        | 47.12%        | 48.88%        |
| Caa  | 41.32%        | 93.48%        | na            | na            | na            |
| Investment-Grade                           | 0.32%         | 0.87%         | 1.60%         | 2.34%         | 2.92%         |
| Speculative-Grade                          | 10.37%        | 22.17%        | 31.45%        | 37.02%        | 43.29%        |
| All  | 0.83%         | 1.93%         | 3.10%         | 4.09%         | 5.02%         |
| <b>US ABS (excl. both MH and HEL)</b>      | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-Year</b> |
| Aaa  | 0.00%         | 0.05%         | 0.18%         | 0.29%         | 0.48%         |
| Aa   | 1.19%         | 2.42%         | 3.36%         | 3.76%         | 4.48%         |
| A  | 0.23%         | 0.71%         | 1.23%         | 1.67%         | 1.89%         |
| Baa  | 1.27%         | 3.42%         | 6.05%         | 7.28%         | 7.89%         |
| Ba   | 4.55%         | 15.10%        | 22.05%        | 23.51%        | 26.39%        |
| B  | 24.72%        | 40.85%        | 43.74%        | 43.74%        | 43.74%        |
| Caa  | 27.96%        | 89.71%        | na            | na            | na            |
| Investment-Grade                           | 0.30%         | 0.79%         | 1.35%         | 1.70%         | 1.96%         |
| Speculative-Grade                          | 10.75%        | 23.16%        | 29.05%        | 30.14%        | 32.26%        |
| All  | 0.66%         | 1.49%         | 2.19%         | 2.56%         | 2.86%         |
| <b>US RMBS &amp; HEL</b>                   | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-Year</b> |
| Aaa  | 0.01%         | 0.13%         | 0.34%         | 0.59%         | 0.76%         |
| Aa   | 0.04%         | 0.09%         | 0.24%         | 0.42%         | 0.47%         |
| A  | 0.17%         | 0.63%         | 1.12%         | 1.41%         | 1.56%         |
| Baa  | 1.20%         | 3.11%         | 5.49%         | 7.59%         | 9.07%         |
| Ba   | 3.22%         | 7.46%         | 11.00%        | 13.21%        | 15.39%        |
| B  | 5.89%         | 11.34%        | 16.27%        | 18.74%        | 19.83%        |
| Caa  | 42.31%        | 49.52%        | 52.67%        | 57.41%        | 57.41%        |
| Investment-Grade                           | 0.31%         | 0.86%         | 1.58%         | 2.24%         | 2.68%         |
| Speculative-Grade                          | 4.77%         | 9.45%         | 13.42%        | 15.74%        | 17.56%        |
| All  | 0.83%         | 1.90%         | 3.05%         | 3.94%         | 4.57%         |

**Figure 23 – Multi-Year Cumulative Impairment Rates by Sector and by Original Rating, 1993-2003**

| <b>US ABS, CMBS &amp; RMBS</b> | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-Year</b> |
|--------------------------------|---------------|---------------|---------------|---------------|---------------|
| Aaa                            | 0.00%         | 0.00%         | 0.06%         | 0.15%         | 0.27%         |
| Aa                             | 0.41%         | 0.62%         | 0.90%         | 1.18%         | 1.33%         |
| A                              | 0.03%         | 0.33%         | 0.85%         | 1.12%         | 1.23%         |
| Baa                            | 0.24%         | 1.46%         | 3.04%         | 4.14%         | 5.10%         |
| Ba                             | 0.79%         | 3.16%         | 5.72%         | 7.42%         | 8.15%         |
| B                              | 1.54%         | 4.12%         | 8.82%         | 10.79%        | 11.46%        |
| Caa                            | 3.57%         | 3.57%         | 14.92%        | 26.52%        | 26.52%        |
| Investment-Grade               | 0.14%         | 0.56%         | 1.15%         | 1.57%         | 1.90%         |
| Speculative-Grade              | 1.11%         | 3.53%         | 7.00%         | 8.93%         | 9.63%         |
| All                            | 0.26%         | 0.91%         | 1.84%         | 2.45%         | 2.82%         |
| <b>US ABS (incl. HEL)</b>      | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-Year</b> |
| Aaa                            | 0.00%         | 0.00%         | 0.07%         | 0.07%         | 0.16%         |
| Aa                             | 0.89%         | 1.34%         | 1.65%         | 1.96%         | 2.19%         |
| A                              | 0.04%         | 0.48%         | 1.08%         | 1.50%         | 1.63%         |
| Baa                            | 0.26%         | 1.67%         | 3.57%         | 5.07%         | 6.48%         |
| Ba                             | 2.87%         | 10.63%        | 17.18%        | 22.16%        | 24.51%        |
| B                              | 10.17%        | 23.73%        | 38.98%        | 45.76%        | 47.48%        |
| Caa                            | 50.00%        | 50.00%        | 50.00%        | 50.00%        | 50.00%        |
| Investment-Grade               | 0.21%         | 0.73%         | 1.41%         | 1.93%         | 2.36%         |
| Speculative-Grade              | 4.27%         | 12.91%        | 20.83%        | 26.08%        | 28.32%        |
| All                            | 0.38%         | 1.23%         | 2.22%         | 2.94%         | 3.46%         |
| <b>US CMBS</b>                 | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-Year</b> |
| Aaa                            | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| Aa                             | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| A                              | 0.00%         | 0.00%         | 0.52%         | 0.52%         | 0.52%         |
| Baa                            | 0.21%         | 1.29%         | 1.52%         | 1.64%         | 1.64%         |
| Ba                             | 0.21%         | 0.42%         | 1.06%         | 1.49%         | 1.49%         |
| B                              | 0.70%         | 1.65%         | 5.48%         | 6.95%         | 7.44%         |
| Caa                            | 0.00%         | 0.00%         | 12.77%        | 25.85%        | 25.85%        |
| Investment-Grade               | 0.08%         | 0.51%         | 0.73%         | 0.77%         | 0.77%         |
| Speculative-Grade              | 0.43%         | 0.97%         | 3.39%         | 4.62%         | 4.84%         |
| All                            | 0.18%         | 0.63%         | 1.49%         | 1.88%         | 1.95%         |
| <b>US RMBS</b>                 | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-Year</b> |
| Aaa                            | 0.00%         | 0.00%         | 0.06%         | 0.30%         | 0.49%         |
| Aa                             | 0.00%         | 0.00%         | 0.37%         | 0.75%         | 0.84%         |
| A                              | 0.00%         | 0.12%         | 0.37%         | 0.37%         | 0.50%         |
| Baa                            | 0.22%         | 1.20%         | 3.38%         | 4.58%         | 5.47%         |
| Ba                             | 0.00%         | 1.05%         | 2.94%         | 3.78%         | 4.20%         |
| B                              | 1.02%         | 3.76%         | 7.54%         | 9.26%         | 9.96%         |
| Caa                            |               |               |               |               |               |
| Investment-Grade               | 0.04%         | 0.27%         | 0.87%         | 1.30%         | 1.60%         |
| Speculative-Grade              | 0.39%         | 2.07%         | 4.68%         | 5.85%         | 6.38%         |
| All                            | 0.09%         | 0.53%         | 1.43%         | 1.97%         | 2.30%         |

| <b>US ABS (excl. Manufactured Housing)</b> | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-Year</b> |
|--|---------------|---------------|---------------|---------------|---------------|
| Aaa  | 0.00%         | 0.00%         | 0.08%         | 0.08%         | 0.17%         |
| Aa   | 0.94%         | 1.28%         | 1.54%         | 1.54%         | 1.63%         |
| A  | 0.04%         | 0.41%         | 0.74%         | 1.09%         | 1.18%         |
| Baa  | 0.06%         | 0.65%         | 1.77%         | 2.31%         | 2.74%         |
| Ba   | 0.76%         | 6.15%         | 10.46%        | 12.84%        | 15.25%        |
| B  | 8.77%         | 22.81%        | 36.84%        | 43.86%        | 45.64%        |
| Caa  | 50.00%        | 50.00%        | 50.00%        | 50.00%        | 50.00%        |
| Investment-Grade                           | 0.16%         | 0.45%         | 0.87%         | 1.09%         | 1.26%         |
| Speculative-Grade                          | 2.48%         | 9.39%         | 15.43%        | 18.65%        | 20.94%        |
| All  | 0.25%         | 0.80%         | 1.43%         | 1.78%         | 2.03%         |
| <b>US ABS (excl. MH and HEL)</b>           | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-Year</b> |
| Aaa  | 0.00%         | 0.00%         | 0.12%         | 0.12%         | 0.26%         |
| Aa   | 3.07%         | 4.21%         | 5.08%         | 5.08%         | 5.42%         |
| A  | 0.00%         | 0.60%         | 1.02%         | 1.39%         | 1.55%         |
| Baa  | 0.00%         | 1.37%         | 3.59%         | 4.24%         | 4.24%         |
| Ba   | 1.36%         | 6.89%         | 12.58%        | 12.58%        | 12.58%        |
| B  | 9.52%         | 38.10%        | 42.86%        | 42.86%        | 42.86%        |
| Caa  | 50.00%        | 50.00%        | 50.00%        | 50.00%        | 50.00%        |
| Investment-Grade                           | 0.27%         | 0.75%         | 1.31%         | 1.52%         | 1.67%         |
| Speculative-Grade                          | 2.93%         | 11.30%        | 16.80%        | 16.80%        | 16.80%        |
| All  | 0.37%         | 1.17%         | 1.92%         | 2.12%         | 2.26%         |
| <b>US RMBS &amp; HEL</b>                   | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-Year</b> |
| Aaa  | 0.00%         | 0.00%         | 0.04%         | 0.20%         | 0.33%         |
| Aa   | 0.00%         | 0.00%         | 0.21%         | 0.43%         | 0.48%         |
| A  | 0.06%         | 0.11%         | 0.34%         | 0.51%         | 0.57%         |
| Baa  | 0.14%         | 0.71%         | 2.04%         | 2.85%         | 3.56%         |
| Ba   | 0.00%         | 1.85%         | 3.89%         | 5.58%         | 6.95%         |
| B  | 1.82%         | 4.87%         | 10.38%        | 13.13%        | 14.06%        |
| Caa  | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| Investment-Grade                           | 0.05%         | 0.20%         | 0.65%         | 0.99%         | 1.24%         |
| Speculative-Grade                          | 0.65%         | 2.93%         | 6.19%         | 8.26%         | 9.47%         |
| All  | 0.11%         | 0.48%         | 1.21%         | 1.72%         | 2.07%         |

**Figure 24 – Multi-Year Cumulative Loss Rates by Sector and by Cohort Rating,<sup>38</sup> 1994-2003**

| <b>US ABS, CMBS &amp; RMBS</b> | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-Year</b> |
|--------------------------------|---------------|---------------|---------------|---------------|---------------|
| Aaa                            | 0.00%         | 0.01%         | 0.02%         | 0.02%         | 0.03%         |
| Aa                             | 0.01%         | 0.04%         | 0.08%         | 0.11%         | 0.12%         |
| A                              | 0.09%         | 0.29%         | 0.41%         | 0.46%         | 0.48%         |
| Baa                            | 0.60%         | 1.70%         | 2.88%         | 3.65%         | 4.07%         |
| Ba                             | 1.95%         | 3.94%         | 5.16%         | 6.25%         | 6.72%         |
| B                              | 3.22%         | 6.45%         | 9.15%         | 10.22%        | 10.55%        |
| Caa                            | 18.15%        | 21.04%        | 23.21%        | 25.10%        | 25.10%        |
| Investment-Grade               | 0.15%         | 0.43%         | 0.71%         | 0.87%         | 0.95%         |
| Speculative-Grade              | 2.97%         | 5.49%         | 7.28%         | 8.44%         | 8.85%         |
| All                            | 0.49%         | 1.03%         | 1.49%         | 1.76%         | 1.89%         |
| <b>US ABS (incl. HEL)</b>      | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-Year</b> |
| Aaa                            | 0.00%         | 0.00%         | 0.01%         | 0.01%         | 0.01%         |
| Aa                             | 0.03%         | 0.09%         | 0.18%         | 0.25%         | 0.28%         |
| A                              | 0.11%         | 0.34%         | 0.50%         | 0.59%         | 0.62%         |
| Baa                            | 0.97%         | 2.83%         | 5.11%         | 6.73%         | 7.83%         |
| Ba                             | 5.15%         | 10.54%        | 13.58%        | 17.04%        | 18.49%        |
| B                              | 11.58%        | 20.18%        | 24.82%        | 26.60%        | 26.92%        |
| Caa                            | 32.07%        | 43.01%        | na            | na            | na            |
| Investment-Grade               | 0.21%         | 0.61%         | 1.04%         | 1.32%         | 1.51%         |
| Speculative-Grade              | 8.12%         | 14.75%        | 18.55%        | 21.97%        | 23.19%        |
| All                            | 0.67%         | 1.44%         | 2.11%         | 2.60%         | 2.89%         |
| <b>US CMBS</b>                 | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-Year</b> |
| Aaa                            | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| Aa                             | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| A                              | 0.05%         | 0.17%         | 0.28%         | 0.32%         | 0.37%         |
| Baa                            | 0.24%         | 0.65%         | 0.80%         | 0.90%         | 0.94%         |
| Ba                             | 0.39%         | 0.69%         | 1.05%         | 1.26%         | 1.26%         |
| B                              | 1.76%         | 4.32%         | 7.56%         | 9.12%         | 9.81%         |
| Caa                            | 5.31%         | 8.27%         | 12.23%        | 15.56%        | 15.56%        |
| Investment-Grade               | 0.09%         | 0.25%         | 0.33%         | 0.37%         | 0.39%         |
| Speculative-Grade              | 1.19%         | 2.48%         | 4.13%         | 5.02%         | 5.34%         |
| All                            | 0.36%         | 0.80%         | 1.21%         | 1.40%         | 1.47%         |
| <b>US RMBS</b>                 | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-Year</b> |
| Aaa                            | 0.00%         | 0.01%         | 0.03%         | 0.04%         | 0.04%         |
| Aa                             | 0.00%         | 0.01%         | 0.03%         | 0.05%         | 0.05%         |
| A                              | 0.08%         | 0.22%         | 0.27%         | 0.28%         | 0.29%         |
| Baa                            | 0.42%         | 1.14%         | 1.79%         | 2.13%         | 2.25%         |
| Ba                             | 1.01%         | 1.93%         | 2.53%         | 2.85%         | 3.06%         |
| B                              | 2.30%         | 4.49%         | 6.20%         | 6.82%         | 7.01%         |
| Caa                            | 17.00%        | 18.56%        | 19.49%        | 20.74%        | 20.74%        |
| Investment-Grade               | 0.10%         | 0.28%         | 0.44%         | 0.52%         | 0.55%         |
| Speculative-Grade              | 1.75%         | 3.08%         | 4.05%         | 4.47%         | 4.67%         |
| All                            | 0.31%         | 0.65%         | 0.91%         | 1.04%         | 1.09%         |

38. Loss severity rates by rating category on defaulted CMBS and non-HEL ABS securities are assumed to be the same as those on defaulted RMBS and HEL securities.

| <b>US ABS (excl. Manufactured Housing)</b> | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-Year</b> |
|--|---------------|---------------|---------------|---------------|---------------|
| Aaa  | 0.00%         | 0.00%         | 0.01%         | 0.01%         | 0.02%         |
| Aa   | 0.02%         | 0.08%         | 0.13%         | 0.14%         | 0.16%         |
| A  | 0.07%         | 0.20%         | 0.30%         | 0.38%         | 0.40%         |
| Baa  | 0.52%         | 1.43%         | 2.41%         | 3.32%         | 3.70%         |
| Ba   | 2.24%         | 5.80%         | 8.40%         | 9.74%         | 11.27%        |
| B  | 8.36%         | 15.83%        | 20.83%        | 22.90%        | 23.27%        |
| Caa  | 26.69%        | 39.45%        | na            | na            | na            |
| Investment-Grade                           | 0.11%         | 0.31%         | 0.49%         | 0.62%         | 0.68%         |
| Speculative-Grade                          | 4.98%         | 9.83%         | 13.26%        | 14.83%        | 16.00%        |
| All  | 0.36%         | 0.78%         | 1.13%         | 1.34%         | 1.45%         |
| <b>US ABS (excl. both MH and HEL)</b>      | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-Year</b> |
| Aaa  | 0.00%         | 0.00%         | 0.01%         | 0.02%         | 0.02%         |
| Aa   | 0.06%         | 0.20%         | 0.30%         | 0.34%         | 0.39%         |
| A  | 0.08%         | 0.21%         | 0.31%         | 0.37%         | 0.38%         |
| Baa  | 0.49%         | 1.36%         | 2.19%         | 2.50%         | 2.58%         |
| Ba   | 1.86%         | 5.36%         | 7.32%         | 7.66%         | 8.19%         |
| B  | 11.84%        | 20.51%        | 21.93%        | 21.93%        | 21.93%        |
| Caa  | 18.06%        | 33.16%        | na            | na            | na            |
| Investment-Grade                           | 0.10%         | 0.28%         | 0.42%         | 0.48%         | 0.51%         |
| Speculative-Grade                          | 5.16%         | 10.26%        | 12.44%        | 12.75%        | 13.14%        |
| All  | 0.29%         | 0.61%         | 0.82%         | 0.89%         | 0.93%         |
| <b>US RMBS &amp; HEL</b>                   | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-Year</b> |
| Aaa  | 0.00%         | 0.01%         | 0.03%         | 0.03%         | 0.04%         |
| Aa   | 0.00%         | 0.01%         | 0.02%         | 0.04%         | 0.05%         |
| A  | 0.06%         | 0.19%         | 0.27%         | 0.31%         | 0.33%         |
| Baa  | 0.46%         | 1.24%         | 1.99%         | 2.52%         | 2.70%         |
| Ba   | 1.31%         | 2.72%         | 3.72%         | 4.24%         | 4.64%         |
| B  | 2.82%         | 5.75%         | 8.18%         | 9.09%         | 9.32%         |
| Caa  | 27.33%        | 29.09%        | 29.78%        | 30.72%        | 30.72%        |
| Investment-Grade                           | 0.11%         | 0.30%         | 0.48%         | 0.61%         | 0.64%         |
| Speculative-Grade                          | 2.29%         | 4.21%         | 5.68%         | 6.34%         | 6.68%         |
| All  | 0.36%         | 0.77%         | 1.12%         | 1.30%         | 1.38%         |

**Figure 25 – Multi-Year Cumulative Loss Rates by Sector and by Original Rating,<sup>39</sup> 1993-2003**

| <b>US ABS, CMBS &amp; RMBS</b> | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-Year</b> |
|--------------------------------|---------------|---------------|---------------|---------------|---------------|
| Aaa                            | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.01%         |
| Aa                             | 0.01%         | 0.00%         | 0.06%         | 0.09%         | 0.10%         |
| A                              | 0.00%         | 0.23%         | 0.30%         | 0.37%         | 0.38%         |
| Baa                            | 0.09%         | 0.92%         | 1.49%         | 1.90%         | 2.16%         |
| Ba                             | 0.48%         | 1.53%         | 2.33%         | 2.99%         | 3.24%         |
| B                              | 0.91%         | 2.72%         | 5.05%         | 5.82%         | 5.96%         |
| Investment-Grade               | 0.04%         | 0.30%         | 0.48%         | 0.58%         | 0.64%         |
| Speculative-Grade              | 0.66%         | 2.09%         | 3.49%         | 4.24%         | 4.44%         |
| All                            | 0.11%         | 0.50%         | 0.82%         | 1.00%         | 1.07%         |
| <b>US ABS (incl. HEL)</b>      | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-Year</b> |
| Aaa                            | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| Aa                             | 0.02%         | 0.00%         | 0.09%         | 0.12%         | 0.13%         |
| A                              | 0.00%         | 0.33%         | 0.41%         | 0.51%         | 0.52%         |
| Baa                            | 0.10%         | 1.05%         | 1.74%         | 2.29%         | 2.68%         |
| Ba                             | 1.76%         | 5.19%         | 7.22%         | 9.16%         | 9.99%         |
| B                              | 6.01%         | 15.51%        | 23.08%        | 25.72%        | 26.09%        |
| Investment-Grade               | 0.06%         | 0.38%         | 0.58%         | 0.71%         | 0.79%         |
| Speculative-Grade              | 2.55%         | 7.64%         | 10.84%        | 12.88%        | 13.54%        |
| All                            | 0.16%         | 0.67%         | 1.01%         | 1.22%         | 1.33%         |
| <b>US CMBS</b>                 | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-Year</b> |
| Aaa                            | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| Aa                             | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| A                              | 0.00%         | 0.00%         | 0.07%         | 0.07%         | 0.07%         |
| Baa                            | 0.08%         | 0.81%         | 0.89%         | 0.94%         | 0.94%         |
| Ba                             | 0.13%         | 0.22%         | 0.42%         | 0.59%         | 0.59%         |
| B                              | 0.41%         | 1.08%         | 2.98%         | 3.55%         | 3.66%         |
| Investment-Grade               | 0.02%         | 0.29%         | 0.36%         | 0.37%         | 0.37%         |
| Speculative-Grade              | 0.26%         | 0.58%         | 1.55%         | 2.03%         | 2.10%         |
| All                            | 0.07%         | 0.35%         | 0.64%         | 0.76%         | 0.77%         |
| <b>US RMBS</b>                 | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-Year</b> |
| Aaa                            | 0.00%         | 0.00%         | 0.00%         | 0.01%         | 0.01%         |
| Aa                             | 0.00%         | 0.00%         | 0.05%         | 0.09%         | 0.09%         |
| A                              | 0.00%         | 0.09%         | 0.13%         | 0.13%         | 0.14%         |
| Baa                            | 0.09%         | 0.74%         | 1.53%         | 1.98%         | 2.22%         |
| Ba                             | 0.00%         | 0.46%         | 1.05%         | 1.38%         | 1.53%         |
| B                              | 0.61%         | 2.53%         | 4.40%         | 5.07%         | 5.22%         |
| Investment-Grade               | 0.01%         | 0.15%         | 0.33%         | 0.44%         | 0.49%         |
| Speculative-Grade              | 0.23%         | 1.23%         | 2.28%         | 2.73%         | 2.89%         |
| All                            | 0.04%         | 0.30%         | 0.61%         | 0.77%         | 0.84%         |

39. Loss severity rates by rating category on defaulted CMBS and non-HEL ABS securities are assumed to be the same as those on defaulted RMBS and HEL securities.

| <b>US ABS (excl. Manufactured Housing)</b> | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-Year</b> |
|--|---------------|---------------|---------------|---------------|---------------|
| Aaa  | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| Aa   | 0.02%         | 0.00%         | 0.08%         | 0.08%         | 0.08%         |
| A  | 0.00%         | 0.28%         | 0.32%         | 0.41%         | 0.41%         |
| Baa  | 0.02%         | 0.42%         | 0.82%         | 1.03%         | 1.14%         |
| Ba   | 0.46%         | 2.85%         | 4.19%         | 5.11%         | 5.96%         |
| B  | 5.19%         | 15.02%        | 21.98%        | 24.72%        | 25.10%        |
| Investment-Grade                           | 0.04%         | 0.23%         | 0.35%         | 0.41%         | 0.43%         |
| Speculative-Grade                          | 1.48%         | 5.55%         | 7.99%         | 9.25%         | 9.92%         |
| All  | 0.10%         | 0.44%         | 0.65%         | 0.75%         | 0.80%         |
| <b>US ABS (excl. both MH and HEL)</b>      | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-Year</b> |
| Aaa  | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.01%         |
| Aa   | 0.06%         | 0.00%         | 0.25%         | 0.25%         | 0.27%         |
| A  | 0.00%         | 0.45%         | 0.51%         | 0.60%         | 0.61%         |
| Baa  | 0.00%         | 0.92%         | 1.72%         | 1.96%         | 1.96%         |
| Ba   | 0.83%         | 3.28%         | 5.05%         | 5.05%         | 5.05%         |
| B  | 5.63%         | 25.65%        | 28.01%        | 28.01%        | 28.01%        |
| Investment-Grade                           | 0.07%         | 0.38%         | 0.54%         | 0.60%         | 0.62%         |
| Speculative-Grade                          | 1.75%         | 6.68%         | 8.90%         | 8.90%         | 8.90%         |
| All  | 0.15%         | 0.64%         | 0.89%         | 0.95%         | 0.98%         |
| <b>US RMBS &amp; HEL</b>                   | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-Year</b> |
| Aaa  | 0.00%         | 0.00%         | 0.00%         | 0.01%         | 0.01%         |
| Aa   | 0.00%         | 0.00%         | 0.03%         | 0.05%         | 0.05%         |
| A  | 0.00%         | 0.04%         | 0.07%         | 0.12%         | 0.12%         |
| Baa  | 0.06%         | 0.44%         | 0.92%         | 1.22%         | 1.42%         |
| Ba   | 0.00%         | 0.82%         | 1.45%         | 2.11%         | 2.59%         |
| B  | 1.08%         | 3.21%         | 5.95%         | 7.02%         | 7.22%         |
| Investment-Grade                           | 0.01%         | 0.11%         | 0.25%         | 0.33%         | 0.37%         |
| Speculative-Grade                          | 0.39%         | 1.73%         | 3.05%         | 3.85%         | 4.21%         |
| All  | 0.04%         | 0.27%         | 0.52%         | 0.67%         | 0.74%         |

**Figure 26 – Multi-Year Cumulative Default Rates and Loss Rates in US Corporate Finance, 1983-2003**

| <b>US Corporate Default Rates</b> | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-Year</b> |
|-----------------------------------|---------------|---------------|---------------|---------------|---------------|
| Aaa                               | 0.00%         | 0.00%         | 0.00%         | 0.13%         | 0.40%         |
| Aa                                | 0.00%         | 0.00%         | 0.08%         | 0.25%         | 0.40%         |
| A                                 | 0.03%         | 0.13%         | 0.36%         | 0.61%         | 0.81%         |
| Baa                               | 0.24%         | 0.70%         | 1.18%         | 1.87%         | 2.52%         |
| Ba                                | 1.45%         | 4.32%         | 7.65%         | 10.89%        | 13.85%        |
| B                                 | 6.54%         | 14.30%        | 21.50%        | 27.77%        | 33.39%        |
| Caa-C                             | 22.13%        | 34.78%        | 44.63%        | 52.84%        | 59.15%        |
| Investment-Grade                  | 0.10%         | 0.29%         | 0.57%         | 0.93%         | 1.27%         |
| Speculative-Grade                 | 5.55%         | 11.40%        | 16.89%        | 21.69%        | 25.83%        |
| All                               | 2.20%         | 4.50%         | 6.61%         | 8.45%         | 9.95%         |
| <b>US Corporate Loss Rates</b>    | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-Year</b> |
| Aaa                               | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.08%         |
| Aa                                | 0.00%         | 0.00%         | 0.05%         | 0.15%         | 0.24%         |
| A                                 | 0.02%         | 0.07%         | 0.20%         | 0.34%         | 0.45%         |
| Baa                               | 0.14%         | 0.40%         | 0.67%         | 1.08%         | 1.49%         |
| Ba                                | 0.91%         | 2.62%         | 4.63%         | 6.51%         | 8.20%         |
| B                                 | 4.19%         | 9.24%         | 13.83%        | 17.89%        | 21.39%        |
| Caa-C                             | 15.85%        | 25.66%        | 33.75%        | 39.69%        | 45.23%        |
| Investment-Grade                  | 0.05%         | 0.16%         | 0.32%         | 0.53%         | 0.73%         |
| Speculative-Grade                 | 3.63%         | 7.50%         | 11.09%        | 14.13%        | 16.64%        |
| All                               | 1.42%         | 2.90%         | 4.25%         | 5.37%         | 6.27%         |



**Figure 27 – Moody’s Idealized Loss Rates Table**

| Rating | Horizon  |          |          |          |          |          |          |          |          |          |
|--------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
|        | 1-Year   | 2-Year   | 3-Year   | 4-Year   | 5-Year   | 6-Year   | 7-Year   | 8-Year   | 9-Year   | 10-Year  |
| Aaa    | 0.0000%  | 0.0001%  | 0.0004%  | 0.0010%  | 0.0016%  | 0.0022%  | 0.0029%  | 0.0036%  | 0.0045%  | 0.0055%  |
| Aa1    | 0.0003%  | 0.0017%  | 0.0055%  | 0.0116%  | 0.0171%  | 0.0231%  | 0.0297%  | 0.0369%  | 0.0451%  | 0.0550%  |
| Aa2    | 0.0007%  | 0.0044%  | 0.0143%  | 0.0259%  | 0.0374%  | 0.0490%  | 0.0611%  | 0.0743%  | 0.0902%  | 0.1100%  |
| Aa3    | 0.0017%  | 0.0105%  | 0.0325%  | 0.0556%  | 0.0781%  | 0.1007%  | 0.1249%  | 0.1496%  | 0.1799%  | 0.2200%  |
| A1     | 0.0032%  | 0.0204%  | 0.0644%  | 0.1040%  | 0.1436%  | 0.1815%  | 0.2233%  | 0.2640%  | 0.3152%  | 0.3850%  |
| A2     | 0.0060%  | 0.0385%  | 0.1221%  | 0.1898%  | 0.2569%  | 0.3207%  | 0.3905%  | 0.4560%  | 0.5401%  | 0.6600%  |
| A3     | 0.0214%  | 0.0825%  | 0.1980%  | 0.2970%  | 0.4015%  | 0.5005%  | 0.6105%  | 0.7150%  | 0.8360%  | 0.9900%  |
| Baa1   | 0.0495%  | 0.1540%  | 0.3080%  | 0.4565%  | 0.6050%  | 0.7535%  | 0.9185%  | 1.0835%  | 1.2485%  | 1.4300%  |
| Baa2   | 0.0935%  | 0.2585%  | 0.4565%  | 0.6600%  | 0.8690%  | 1.0835%  | 1.3255%  | 1.5675%  | 1.7820%  | 1.9800%  |
| Baa3   | 0.2310%  | 0.5775%  | 0.9405%  | 1.3090%  | 1.6775%  | 2.0350%  | 2.3815%  | 2.7335%  | 3.0635%  | 3.3550%  |
| Ba1    | 0.4785%  | 1.1110%  | 1.7215%  | 2.3100%  | 2.9040%  | 3.4375%  | 3.8830%  | 4.3395%  | 4.7795%  | 5.1700%  |
| Ba2    | 0.8580%  | 1.9085%  | 2.8490%  | 3.7400%  | 4.6255%  | 5.3735%  | 5.8850%  | 6.4130%  | 6.9575%  | 7.4250%  |
| Ba3    | 1.5455%  | 3.0305%  | 4.3285%  | 5.3845%  | 6.5230%  | 7.4195%  | 8.0410%  | 8.6405%  | 9.1905%  | 9.7130%  |
| B1     | 2.5740%  | 4.6090%  | 6.3690%  | 7.6175%  | 8.8660%  | 9.8395%  | 10.5215% | 11.1265% | 11.6820% | 12.2100% |
| B2     | 3.9380%  | 6.4185%  | 8.5525%  | 9.9715%  | 11.3905% | 12.4575% | 13.2055% | 13.8325% | 14.4210% | 14.9600% |
| B3     | 6.3910%  | 9.1355%  | 11.5665% | 13.2220% | 14.8775% | 16.0600% | 17.0500% | 17.9190% | 18.5790% | 19.1950% |
| Caa1   | 9.5599%  | 12.7788% | 15.7512% | 17.8634% | 19.9726% | 21.4317% | 22.7620% | 24.0113% | 25.1195% | 26.2350% |
| Caa2   | 14.3000% | 17.8750% | 21.4500% | 24.1340% | 26.8125% | 28.6000% | 30.3875% | 32.1750% | 33.9625% | 35.7500% |
| Caa3   | 28.0446% | 31.3548% | 34.3475% | 36.4331% | 38.4017% | 39.6611% | 40.8817% | 42.0669% | 43.2196% | 44.3850% |

**Figure 28 – Summary Statistics for the Distribution of One-Year Impairment Rates, 1994-2003**

| US ABS, CMBS & RMBS | Weighted Average | Simple Average | Median | Standard Deviation | Maximum |
|---------------------|------------------|----------------|--------|--------------------|---------|
| Aaa                 | 0.01%            | 0.00%          | 0.00%  | 0.01%              | 0.04%   |
| Aa                  | 0.23%            | 0.17%          | 0.06%  | 0.24%              | 0.68%   |
| A                   | 0.27%            | 0.19%          | 0.08%  | 0.25%              | 0.78%   |
| Baa                 | 1.55%            | 1.27%          | 1.06%  | 0.99%              | 2.71%   |
| Ba                  | 4.79%            | 3.48%          | 3.33%  | 2.62%              | 7.87%   |
| B                   | 6.71%            | 5.88%          | 6.19%  | 4.21%              | 14.15%  |
| Caa                 | 28.10%           | 20.87%         | 17.50% | 25.96%             | 83.33%  |
| Investment-Grade    | 0.44%            | 0.34%          | 0.26%  | 0.36%              | 0.73%   |
| Speculative-Grade   | 6.19%            | 4.80%          | 3.05%  | 4.84%              | 9.51%   |
| All                 | 1.11%            | 0.86%          | 0.50%  | 0.98%              | 1.71%   |

**Figure 29 – Distribution of US ABS Impairments by Asset Type, 1993-2003**

|                             | Total Number of Securities Studied | Number of Impaired Securities | Lifetime Impairment Rate by Number of Securities | Total Number of Deals Studied | Number of Impaired Deals | Lifetime Impairment Rate by Number of Deals |
|-----------------------------|------------------------------------|-------------------------------|--|-------------------------------|--------------------------|---|
| Healthcare Receivables      | 32                                 | 12                            | 37.5%  | 17                            | 12                       | 70.6%                                       |
| Franchise Loans             | 148                                | 48                            | 32.4%  | 33                            | 12                       | 36.4%                                       |
| Manufactured Housing        | 662                                | 187                           | 28.2%  | 167                           | 104                      | 62.3%                                       |
| Equipment & Aircraft Leases | 341                                | 11                            | 3.2%   | 130                           | 7                        | 5.4%  |
| HEL                         | 3980                               | 78                            | 2.0%   | 934                           | 52                       | 5.6%  |
| Autos & Trucks              | 837                                | 12                            | 1.4%   | 477                           | 10                       | 2.1%  |
| Credit Cards                | 1500                               | 13                            | 0.9%   | 730                           | 7                        | 1.0%  |
| Others                      | 1477                               | 0                             | 0.0%   | 813                           | 0                        | 0.0%  |
| All US ABS                  | 8977                               | 361                           | 4.0%   | 3301                          | 204                      | 6.2%  |

*Note: Lifetime impairment rate is the ratio of the number of impaired securities or deals over the total number of securities or deals, respectively, issued during the sample period*

**Figure 30 – List of Newly Impaired Securities in 2003**

| Tranche Name  | Deal Name   | Collateral Type       | Sector | Original Rating | Default Year. Month | First Ca/C Year. Month |
|---------------|---|-----------------------|--------|-----------------|---------------------|------------------------|
| Class B       | First Consumer Credit Card Master Note Trust, Series 2001-A | Credit Card           | ABS    | A2              |                     | 2003.04                |
| Class B       | First Consumers Master Trust Series 1999-A                  | Credit Card           | ABS    | A2              |                     | 2003.04                |
| Class C       | NextCard Credit Card Master Note Trust, Series 2000-1       | Credit Card           | ABS    | Baa2            |                     | 2003.01                |
| Class C       | NextCard Credit Card Master Note Trust, Series 2001-1       | Credit Card           | ABS    | Baa2            |                     | 2003.01                |
| Class D       | NextCard Credit Card Master Note Trust, Series 2001-1       | Credit Card           | ABS    | Ba2             |                     | 2003.01                |
| Class A       | Heilig-Meyers Master Trust Series 1998-1                    | Credit Card           | ABS    | Aaa             |                     | 2003.06                |
| Class A       | Heilig-Meyers Master Trust, Series 1998-2                   | Credit Card           | ABS    | Aaa             |                     | 2003.06                |
| Class B       | Captec Grantor Trusts 2000-1                                | Franchise Loans       | ABS    | Aa2             | 2003.02             |                        |
| Class C       | Captec Grantor Trusts 2000-1                                | Franchise Loans       | ABS    | A2              | 2003.02             |                        |
| Class A-2     | EMAC Owner Trust 2000-1                                     | Franchise Loans       | ABS    | Aaa             | 2003.04             |                        |
| Class E       | FFCA Secured Franchise Loan Grantor Trust 2000-1            | Franchise Loans       | ABS    | Baa1            |                     | 2003.06                |
| Class E       | FFCA Secured Franchise Loan Owner Trust 2000-1              | Franchise Loans       | ABS    | Baa1            |                     | 2003.06                |
| Class F       | FFCA Secured Franchise Loan Owner Trust 2000-1              | Franchise Loans       | ABS    | Baa2            | 2003.09             | 2003.06                |
| Class G       | FFCA Secured Franchise Loan Owner Trust 2000-1              | Franchise Loans       | ABS    | Baa3            | 2003.09             | 2003.06                |
| Class H       | FFCA Secured Franchise Loan Owner Trust 2000-1              | Franchise Loans       | ABS    | Ba2             | 2003.09             | 2003.06                |
| Class B       | FMAC Loan Receivables Trust 1998-C                          | Franchise Loans       | ABS    | Aa3             | 2003.06             |                        |
| Class C       | FMAC Loan Receivables Trust 1998-C                          | Franchise Loans       | ABS    | A2              | 2003.01             | 2003.03                |
| Class D       | MSDWMC Owner Trust 2000-F1                                  | Franchise Loans       | ABS    | A2              | 2003.10             |                        |
| Class E       | MSDWMC Owner Trust 2000-F1                                  | Franchise Loans       | ABS    | Baa2            | 2003.08             |                        |
| Class F       | MSDWMC Owner Trust 2000-F1                                  | Franchise Loans       | ABS    | Baa3            | 2003.05             |                        |
| Class G       | MSDWMC Owner Trust 2000-F1                                  | Franchise Loans       | ABS    | Ba2             | 2003.05             |                        |
| Class H       | MSDWMC Owner Trust 2000-F1                                  | Franchise Loans       | ABS    | B2              | 2003.05             | 2003.07                |
| Ser. D        | Air 2 US, Series A, B, C, D Enhanced Equipment Notes        | Leases – Aircraft     | ABS    | Baa3            |                     | 2003.02                |
| B Refinancing | Airplanes Pass Through Trust                                | Leases - Aircraft     | ABS    | A2              | 2003.12             |                        |
| C             | Airplanes Pass Through Trust                                | Leases - Aircraft     | ABS    | Baa2            | 2003.12             |                        |
| Class C       | Centerpoint Funding Company II, LLC                         | Leases - Equipment    | ABS    | Ba2             |                     | 2003.07                |
| Class E       | DVI Receivables XVI, L.L.C. Series 2001-2                   | Leases - Equipment    | ABS    | Ba2             |                     | 2003.11                |
| Cl. C         | Centerpoint Funding Company II, L.L.C. Series 2001-1        | Leases - Small-Ticket | ABS    | Ba2             |                     | 2003.07                |
| B-2           | Associates Manufactured Housing 1997-2                      | Manufactured Housing  | ABS    | Ba2             | 2003.07             |                        |
| M             | BankAmerica MH Contract 1998-1                              | Manufactured Housing  | ABS    | Aa3             | 2003.04             |                        |
| B-1           | BankAmerica MH Contract 1998-1                              | Manufactured Housing  | ABS    | Baa2            | 2003.01             |                        |
| B-1-          | Bombardier Capital Mortgage Securitization Corp 1998-B      | Manufactured Housing  | ABS    | Baa2            | 2003.06             |                        |
| B-2           | Bombardier Capital Mortgage Securitization Corp 1999-A      | Manufactured Housing  | ABS    | Ba2             | 2003.09             |                        |
| M-2           | Bombardier Capital Mortgage Securitization Corp 1999-B      | Manufactured Housing  | ABS    | A2              | 2003.06             |                        |
| Cl. M-2       | Bombardier Capital Mortgage Securitization Corp 2000-A      | Manufactured Housing  | ABS    | A2              | 2003.08             |                        |
| Cl. B-1       | Bombardier Capital Mortgage Securitization Corp 2000-A      | Manufactured Housing  | ABS    | Baa2            | 2003.01             |                        |
| Cl. B-2       | Bombardier Capital Mortgage Securitization Corp 2001-A      | Manufactured Housing  | ABS    | Ba2             | 2003.07             |                        |
| Class B-2     | Conseco Finance Securitization Corp. Series 2001-4          | Manufactured Housing  | ABS    | Ba3             | 2003.01             | 2003.12                |

| Tranche Name | Deal Name  | Collateral Type      | Sector | Original Rating | Default Year. Month | First Ca/C Year. Month |
|--------------|--|----------------------|--------|-----------------|---------------------|------------------------|
| Cl. M-2      | Conseco Finance Securitizations Corp. Series 1999-6          | Manufactured Housing | ABS    | A2              |                     | 2003.12                |
| Cl. B-1      | Conseco Finance Securitizations Corp. Series 1999-6          | Manufactured Housing | ABS    | Baa2            | 2003.07             | 2003.12                |
| Cl. M-2      | Conseco Finance Securitizations Corp. Series 2000-1          | Manufactured Housing | ABS    | A2              | 2003.12             | 2003.12                |
| Cl. B-1      | Conseco Finance Securitizations Corp. Series 2000-1          | Manufactured Housing | ABS    | Baa2            | 2003.07             | 2003.12                |
| Cl. M-2      | Conseco Finance Securitizations Corp. Series 2000-2          | Manufactured Housing | ABS    | A2              |                     | 2003.12                |
| Cl. B-1      | Conseco Finance Securitizations Corp. Series 2000-2          | Manufactured Housing | ABS    | Baa1            | 2003.09             | 2003.12                |
| Cl. M-2      | Conseco Finance Securitizations Corp. Series 2000-3          | Manufactured Housing | ABS    | A2              |                     | 2003.12                |
| Cl. B-1      | Conseco Finance Securitizations Corp. Series 2000-3          | Manufactured Housing | ABS    | Baa2            |                     | 2003.12                |
| Cl. M-2      | Conseco Finance Securitizations Corp. Series 2000-4          | Manufactured Housing | ABS    | A2              |                     | 2003.12                |
| Cl. B-1      | Conseco Finance Securitizations Corp. Series 2000-4          | Manufactured Housing | ABS    | Baa2            | 2003.07             | 2003.12                |
| Cl. B-1      | Conseco Finance Securitizations Corp. Series 2000-5          | Manufactured Housing | ABS    | Baa2            | 2003.10             | 2003.12                |
| Cl. M-2      | Conseco Finance Securitizations Corp. Series 2000-5          | Manufactured Housing | ABS    | A2              |                     | 2003.12                |
| Cl. B-1      | Conseco Finance Securitizations Corp. Series 2000-6          | Manufactured Housing | ABS    | Baa2            | 2003.11             | 2003.12                |
| Cl. B-1      | Conseco Finance Securitizations Corp. Series 2001-1          | Manufactured Housing | ABS    | Baa2            | 2003.08             | 2003.12                |
| Cl. B-1      | Conseco Finance Securitizations Corp. Series 2001-2          | Manufactured Housing | ABS    | Baa2            | 2003.09             | 2003.12                |
| Class B-1    | Conseco Finance Securitizations Corp. Series 2001-3          | Manufactured Housing | ABS    | Baa2            |                     | 2003.12                |
| Class B-2    | Conseco Finance Securitizations Corp. Series 2001-3          | Manufactured Housing | ABS    | Ba2             | 2003.01             | 2003.12                |
| Class B-1    | Deutsche Financial Capital Securitization LLC, Series 1997-I | Manufactured Housing | ABS    | Baa2            | 2003.10             | 2003.01                |
| Class B-1    | Deutsche Financial Capital Securitization LLC, Series 1998-I | Manufactured Housing | ABS    | Baa2            | 2003.07             | 2003.01                |
| B            | Green Tree Financial Corporation MH 1993-01                  | Manufactured Housing | ABS    | Baa3            | 2003.04             |                        |
| B            | Green Tree Financial Corporation MH 1993-03                  | Manufactured Housing | ABS    | Baa3            | 2003.04             |                        |
| B-1          | Green Tree Financial Corporation MH 1993-04                  | Manufactured Housing | ABS    | Baa3            | 2003.07             |                        |
| B-2          | Green Tree Financial Corporation MH 1993-04                  | Manufactured Housing | ABS    | Ba2             | 2003.01             | 2003.12                |
| B-2          | Green Tree Financial Corporation MH 1994-01                  | Manufactured Housing | ABS    | Baa1            | 2003.01             | 2003.12                |
| B-1          | Green Tree Financial Corporation MH 1994-06                  | Manufactured Housing | ABS    | Baa1            | 2003.01             |                        |
| B-2          | Green Tree Financial Corporation MH 1994-06                  | Manufactured Housing | ABS    | Baa1            | 2003.01             | 2003.12                |
| B-1          | Green Tree Financial Corporation MH 1994-07                  | Manufactured Housing | ABS    | Baa1            | 2003.01             |                        |
| B-1          | Green Tree Financial Corporation MH 1994-08                  | Manufactured Housing | ABS    | Baa1            | 2003.01             |                        |
| B-1          | Green Tree Financial Corporation MH 1995-01                  | Manufactured Housing | ABS    | Baa1            | 2003.02             |                        |
| B-2          | Green Tree Financial Corporation MH 1995-01                  | Manufactured Housing | ABS    | Baa1            | 2003.01             | 2003.12                |
| B-2          | Green Tree Financial Corporation MH 1995-05                  | Manufactured Housing | ABS    | Baa1            | 2003.01             | 2003.12                |
| B-1          | Green Tree Financial Corporation MH 1996-02                  | Manufactured Housing | ABS    | Baa1            |                     | 2003.12                |
| B-1          | Green Tree Financial Corporation MH 1996-04                  | Manufactured Housing | ABS    | Baa1            |                     | 2003.12                |

| Tranche Name | Deal Name   | Collateral Type      | Sector | Original Rating | Default Year. Month | First Ca/C Year. Month |
|--------------|---|----------------------|--------|-----------------|---------------------|------------------------|
| B-1          | Green Tree Financial Corporation MH 1996-05           | Manufactured Housing | ABS    | Baa1            |                     | 2003.12                |
| B-1          | Green Tree Financial Corporation MH 1996-06           | Manufactured Housing | ABS    | Baa1            |                     | 2003.12                |
| B-1          | Green Tree Financial Corporation MH 1996-07           | Manufactured Housing | ABS    | Baa1            |                     | 2003.12                |
| B-1          | Green Tree Financial Corporation MH 1996-08           | Manufactured Housing | ABS    | Baa1            |                     | 2003.12                |
| B-1          | Green Tree Financial Corporation MH 1996-09           | Manufactured Housing | ABS    | Baa1            |                     | 2003.12                |
| B-1          | Green Tree Financial Corporation MH 1997-01           | Manufactured Housing | ABS    | Baa1            |                     | 2003.12                |
| B-1          | Green Tree Financial Corporation MH 1997-02           | Manufactured Housing | ABS    | Baa1            |                     | 2003.12                |
| B-1          | Green Tree Financial Corporation MH 1997-03           | Manufactured Housing | ABS    | Baa1            |                     | 2003.12                |
| B-1          | Green Tree Financial Corporation MH 1997-04           | Manufactured Housing | ABS    | Baa1            |                     | 2003.12                |
| B-1          | Green Tree Financial Corporation MH 1997-05           | Manufactured Housing | ABS    | Baa1            |                     | 2003.12                |
| B-1          | Green Tree Financial Corporation MH 1997-07           | Manufactured Housing | ABS    | Baa1            |                     | 2003.12                |
| B-2          | Green Tree Financial Corporation MH 1997-07           | Manufactured Housing | ABS    | Baa1            | 2003.01             | 2003.12                |
| B-1          | Green Tree Financial Corporation MH 1998-01           | Manufactured Housing | ABS    | Baa1            |                     | 2003.12                |
| B-1          | Green Tree Financial Corporation MH 1998-02           | Manufactured Housing | ABS    | Baa1            |                     | 2003.12                |
| B-1          | Green Tree Financial Corporation MH 1998-04           | Manufactured Housing | ABS    | Baa1            |                     | 2003.12                |
| B-1          | Green Tree Financial Corporation MH 1998-05           | Manufactured Housing | ABS    | Baa1            |                     | 2003.12                |
| B-1          | Green Tree Financial Corporation MH 1998-07           | Manufactured Housing | ABS    | Baa1            |                     | 2003.12                |
| B-1          | Green Tree Financial Corporation MH 1998-08           | Manufactured Housing | ABS    | Baa2            |                     | 2003.12                |
| Cl. B        | Greenpoint Manufactured Housing Contract Trust 1999-5 | Manufactured Housing | ABS    | Baa2            | 2003.03             |                        |
| Cl. B-1      | OMI Trust 2000-C                                      | Manufactured Housing | ABS    | Baa3            | 2003.10             |                        |
| Cl. B-1      | OMI Trust 2000-D                                      | Manufactured Housing | ABS    | Baa2            | 2003.05             |                        |
| Cl. B-2      | OMI Trust 2000-D                                      | Manufactured Housing | ABS    | Ba2             | 2003.01             |                        |
| Cl. M-2      | OMI Trust 2000-D                                      | Manufactured Housing | ABS    | A2              | 2003.10             |                        |
| Cl. B-1      | OMI Trust 2001-B                                      | Manufactured Housing | ABS    | Baa2            | 2003.07             |                        |
| Cl. M-2      | OMI Trust 2001-B                                      | Manufactured Housing | ABS    | A3              | 2003.10             |                        |
| Cl. B-1      | OMI Trust Series 2001-C                               | Manufactured Housing | ABS    | Baa2            | 2003.07             | 2003.01                |
| Cl. B-2      | OMI Trust Series 2001-C                               | Manufactured Housing | ABS    | Ba2             | 2003.03             | 2003.01                |
| Cl. M-2      | OMI Trust Series 2001-C                               | Manufactured Housing | ABS    | A2              | 2003.12             |                        |
| Cl. B-1      | OMI Trust Series 2001-D                               | Manufactured Housing | ABS    | Baa3            | 2003.10             | 2003.01                |
| Cl. B-2      | OMI Trust Series 2001-D                               | Manufactured Housing | ABS    | Ba2             | 2003.05             | 2003.01                |
| Cl. B-1      | OMI Trust Series 2001-E                               | Manufactured Housing | ABS    | Baa3            | 2003.10             |                        |
| Cl. B-2      | OMI Trust Series 2001-E                               | Manufactured Housing | ABS    | Ba2             | 2003.06             |                        |
| B-1          | Oakwood Mortgage Investors, Inc. Series 1998-A        | Manufactured Housing | ABS    | Baa2            | 2003.10             |                        |

| Tranche Name | Deal Name  | Collateral Type      | Sector | Original Rating | Default Year. Month | First Ca/C Year. Month |
|--------------|--|----------------------|--------|-----------------|---------------------|------------------------|
| B-1          | Oakwood Mortgage Investors, Inc., Series 1998-D  | Manufactured Housing | ABS    | Baa2            | 2003.11             | 2003.01                |
| B-1          | Oakwood Mortgage Investors, Inc., Series 1999-A  | Manufactured Housing | ABS    | Baa2            |                     | 2003.01                |
| B-1          | Oakwood Mortgage Investors, Inc., Series 1999-B  | Manufactured Housing | ABS    | Baa2            | 2003.08             | 2003.01                |
| B-1          | Oakwood Mortgage Investors, Inc., Series 1999-D  | Manufactured Housing | ABS    | Baa2            | 2003.08             | 2003.01                |
| B-2          | Oakwood Mortgage Investors, Inc., Series 1999-D  | Manufactured Housing | ABS    | Ba2             | 2003.01             | 2003.01                |
| Cl. B-1      | Oakwood Mortgage Investors, Inc., Series 1999-E  | Manufactured Housing | ABS    | Baa3            |                     | 2003.01                |
| Cl. B-2      | Oakwood Mortgage Investors, Inc., Series 1999-E  | Manufactured Housing | ABS    | B1              | 2003.03             | 2003.01                |
| Cl. B        | Origen Manufactured Housing Contract Senior/Subordinate Asset-Backed Certificates, Series 2001-A | Manufactured Housing | ABS    | Baa2            | 2003.12             |                        |
| B-1          | UCFC Funding Corporation 1998-2  | Manufactured Housing | ABS    | Baa2            | 2003.11             | 2003.08                |
| M-2          | UCFC Funding Corporation 1998-2  | Manufactured Housing | ABS    | A2              |                     | 2003.08                |
| Cl. B-2      | Conseco Finance Home Loan Trust 1999-G   | HEL                  | ABS    | Ba1             | 2003.02             |                        |
| B-2          | Green Tree Home Improvement & Home Equity Loan Trust 1999-B                                      | HEL                  | ABS    | Ba1             | 2003.01             |                        |
| Class B-2    | Green Tree Home Improvement and Home Equity Loan Trust 1998-F                                    | HEL                  | ABS    | Ba1             | 2003.02             |                        |
| B-3          | CIT Home Equity Loan Trust 1998-1  | HEL                  | ABS    | B2              | 2003.09             |                        |
| Cl. BF-2     | Conseco Finance Home Equity Loan Trust 2000-B  | HEL                  | ABS    | Baa3            | 2003.01             |                        |
| Cl. BF-2     | Conseco Finance Home Equity Loan Trust 2000-F  | HEL                  | ABS    | Ba2             | 2003.01             |                        |
| Cl. I-B-2    | Conseco Finance Home Equity Loan Trust 2001-A  | HEL                  | ABS    | Ba1             | 2003.07             |                        |
| Cl. II-B-2   | Conseco Finance Home Equity Loan Trust 2001-A  | HEL                  | ABS    | Ba2             | 2003.01             |                        |
| Cl. B-2      | Conseco Finance Home Equity and Home Improvement Loan Trust 2001-B                               | HEL                  | ABS    | Ba2             | 2003.07             |                        |
| B            | ContiMortgage Home Equity Loan Trust 1997-5  | HEL                  | ABS    | Baa3            | 2003.08             | 2003.12                |
| B            | ContiMortgage Home Equity Loan Trust 1998-1  | HEL                  | ABS    | Baa3            | 2003.10             |                        |
| B            | ContiMortgage Home Equity Loan Trust 1998-4  | HEL                  | ABS    | Baa2            |                     | 2003.12                |
| B            | ContiMortgage Home Equity Loan Trust 1999-1  | HEL                  | ABS    | Baa3            | 2003.10             | 2003.12                |
| B            | ContiMortgage Home Equity Loan Trust 1999-3  | HEL                  | ABS    | Baa3            |                     | 2003.12                |
| B2           | GE Capital Mtg Services Inc 1996-HE3   | HEL                  | ABS    | Baa2            | 2003.07             | 2003.01                |
| B1           | GE Capital Mtg Services Inc 1997-HE2   | HEL                  | ABS    | A2              | 2003.11             |                        |
| B2           | GE Capital Mtg Services Inc 1997-HE3   | HEL                  | ABS    | Baa2            | 2003.08             | 2003.01                |
| B2           | GE Capital Mtg Services Inc 1997-HE4   | HEL                  | ABS    | Baa2            | 2003.07             | 2003.01                |
| B2           | GE Capital Mtg Services Inc 1998-HE1   | HEL                  | ABS    | Baa2            |                     | 2003.01                |
| B3           | GE Capital Mtg Services Inc 1998-HE2   | HEL                  | ABS    | Ba2             | 2003.01             |                        |
| B3           | GE Capital Mtg Services, Series 1999-HE2   | HEL                  | ABS    | Ba2             |                     | 2003.01                |
| B4           | GE Capital Mtg Services, Series 1999-HE2   | HEL                  | ABS    | B2              | 2003.03             | 2003.01                |
| BF           | IndyMac Home Equity Mortgage Loan Asset-Backed Trust, SPMD 2001-A                                | HEL                  | ABS    | Baa2            | 2003.02             |                        |
| Cl. BF       | IndyMac Home Equity Mortgage Loan Asset-Backed Trust, Series SPMD 2000-C                         | HEL                  | ABS    | Baa2            | 2003.06             |                        |
| B-2          | Metropolitan Asset Funding, Inc. II, Series 1999-A   | HEL                  | ABS    | Ba2             | 2003.11             | 2003.1                 |

| Tranche Name | Deal Name   | Collateral Type | Sector | Original Rating | Default Year. Month | First Ca/C Year. Month |
|--------------|---|-----------------|--------|-----------------|---------------------|------------------------|
| B-1          | ContiMortgage Home Equity Loan Trust 1998-3   | HEL             | ABS    | Baa3            |                     | 2003.12                |
| B-II         | ContiMortgage Home Equity Loan Trust 1998-3   | HEL             | ABS    | Baa3            |                     | 2003.12                |
| B-2          | Green Tree Home Improvement Loans 1994-D  | HEL             | ABS    | Baa1            | 2003.02             |                        |
| B-2          | Green Tree Home Improvement Loans 1996-A  | HEL             | ABS    | Baa1            | 2003.12             |                        |
| A            | Green Tree Home Improvement Loans 1996-B  | HEL             | ABS    | A3              | 2003.02             |                        |
| B-4          | Bear Stearns Mtg Sec Inc 1996-06  | HEL             | ABS    | Ba2             | 2003.08             |                        |
| B-2          | Metropolitan Asset Funding, Inc. II Series, 1998-A                                    | HEL             | ABS    | Ba2             | 2003.09             |                        |
| B-2          | Metropolitan Asset Funding, Inc. II, Series 1998-B                                    | HEL             | ABS    | Ba2             | 2003.11             | 2003.1                 |
| A-2          | Asset Securitization Corporation 1997-D5  | CMBS            | CMBS   | A1              | 2003.07             |                        |
| J            | Bear Stearns Commercial Mortgage Securities Inc 1999-C1                               | CMBS            | CMBS   | B3              | 2003.07             |                        |
| Cl. G        | COMM 2001-J2 Commercial Mortgage Pass-Through Certificates                            | CMBS            | CMBS   | Baa3            | 2003.01             |                        |
| I            | CS First Boston Mortgage Securities Corp 1997-C2                                      | CMBS            | CMBS   | B3              | 2003.04             |                        |
| M            | CS First Boston Mortgage Securities Corp 1999-C1                                      | CMBS            | CMBS   | B3              | 2003.05             |                        |
| Cl. N        | CS First Boston Mortgage Securities Corp 2001-FL2                                     | CMBS            | CMBS   | B3              | 2003.02             | 2003.05                |
| Cl. K-CR     | CS First Boston Mortgage Securities Corp 2001-TFL1                                    | CMBS            | CMBS   | Baa3            | 2003.07             |                        |
| Cl. B-7      | DLJ Commercial Mortgage Trust 2000-CKP1   | CMBS            | CMBS   | B1              | 2003.11             |                        |
| M            | GMAC Commercial Mortgage Securities Inc 1999-C3                                       | CMBS            | CMBS   | Caa2            | 2003.05             |                        |
| F            | GS Mortgage Securities Corporation II 1999-C1   | CMBS            | CMBS   | Ba2             | 2003.10             |                        |
| Cl. G1       | Morgan Stanley Dean Witter Capital I Inc. 2001-XLF                                    | CMBS            | CMBS   | Baa3            | 2003.03             |                        |
| Cl. G6       | Morgan Stanley Dean Witter Capital I Inc. 2001-XLF                                    | CMBS            | CMBS   | Baa3            | 2003.03             |                        |
| Cl. G9       | Morgan Stanley Dean Witter Capital I Inc. 2001-XLF                                    | CMBS            | CMBS   | Baa3            | 2003.03             |                        |
| Cl. H11      | Morgan Stanley Dean Witter Capital I Inc. 2001-XLF                                    | CMBS            | CMBS   | Ba2             | 2003.03             |                        |
| K            | Prudential Securities Secured Financing Corporation 1999-NRF1                         | CMBS            | CMBS   | B2              | 2003.08             |                        |
| L            | Prudential Securities Secured Financing Corporation 1999-NRF1                         | CMBS            | CMBS   | B3              | 2003.08             |                        |
| Cl. M        | Salomon Brothers Mortgage Securities VII, Inc. 2000-C2                                | CMBS            | CMBS   | B2              | 2003.01             |                        |
| Cl. N        | Salomon Brothers Mortgage Securities VII, Inc. 2000-C2                                | CMBS            | CMBS   | B3              | 2003.01             |                        |
| E            | 1251 Avenue of the Americas Trust   | CMBS            | CMBS   | Baa2            | 2003.01             |                        |
| Cl. F        | 280 Park Avenue Trust, Series 2001-XL280  | CMBS            | CMBS   | Baa3            | 2003.01             |                        |
| Cl. F        | Chase Commercial Mortgage Securities Corp., Series 2001-245 Park                      | CMBS            | CMBS   | Baa3            | 2003.07             |                        |
| Cl. E        | Opryland Hotel Trust Commercial Mortgage Pass-Through Certificates, Series 2001-OPRY  | CMBS            | CMBS   | Baa3            | 2003.01             |                        |
| Cl. F        | Sawgrass Mills Trust Commercial Mortgage Pass-Through Certificates, Series 2001-XLSGM | CMBS            | CMBS   | Baa3            | 2003.08             |                        |
| Cl. F        | Hilton Hotels Pool Trust  | CMBS            | CMBS   | A3              | 2003.01             |                        |
| Cl. H        | J.P. Morgan Commercial Mortgage Finance Corp. 2000-FL1                                | CMBS            | CMBS   | B2              | 2003.09             |                        |

| Tranche Name | Deal Name   | Collateral Type | Sector | Original Rating | Default Year. Month | First Ca/C Year. Month |
|--------------|---|-----------------|--------|-----------------|---------------------|------------------------|
| CI. J        | J.P. Morgan Commercial Mortgage Finance Corp. 2000-FL1      | CMBS            | CMBS   | B3              | 2003.06             |                        |
| A-4          | Asset Securitization Corporation 1997-MD VII                | CMBS            | CMBS   | Baa2            | 2003.03             |                        |
| H            | Morgan Stanley Capital I Inc. 1997-XL1                      | CMBS            | CMBS   | B2              | 2003.04             |                        |
| CI. C        | Morgan Stanley Dean Witter Capital I Inc. 2000-XLF          | CMBS            | CMBS   | A2              | 2003.06             |                        |
| CI. D        | Morgan Stanley Dean Witter Capital I Inc. 2000-XLF          | CMBS            | CMBS   | A3              | 2003.06             |                        |
| CI. E        | Morgan Stanley Dean Witter Capital I Inc. 2000-XLF          | CMBS            | CMBS   | Baa2            | 2003.06             | 2003.09                |
| CI. F1       | Morgan Stanley Dean Witter Capital I Inc. 2000-XLF          | CMBS            | CMBS   | Baa3            | 2003.02             | 2003.06                |
| I B-1        | DLJ Mtg Acpt Corp 1994-Q01                                  | RMBS            | RMBS   | Baa3            | 2003.03             |                        |
| II B-1       | DLJ Mtg Acpt Corp 1994-Q01                                  | RMBS            | RMBS   | Baa3            | 2003.07             |                        |
| B-1          | DLJ Mtg Acpt Corp 1996-QB                                   | RMBS            | RMBS   | Baa2            | 2003.11             |                        |
| B-3          | Pass-Through Asset Class Execution 1997-I (CWMBS 1997-4)    | RMBS            | RMBS   | Ba2             | 2003.05             | 2003.09                |
| CI. B-2      | Conseco Finance Trust HE/HI 2001-B-2 Class B-2 Certificates | RMBS            | RMBS   | Baa2            | 2003.07             |                        |



## Related Research

### Special Comments:

[Payment Defaults And Material Impairments Of U.S. Structured Finance Securities: 1993-2002, December 2003, #80247](#)

[Measuring Loss Severity Rates Of Defaulted Residential Mortgage-Backed Securities: A Methodology, April 2004, #86769](#)

[Structured Finance Rating Transitions: 1983-2002, January 2003, #77291](#)

[Structured Finance Rating Transitions: 1983-2003, February 2004, #81239](#)

[Structured Finance Watchlist Resolutions: 1992-2003, June 2004, #87305](#)

[Measuring The Performance Of Corporate Bond Ratings, April 2003, #77916](#)

[Measuring the Performance of Corporate Bond Ratings: July 2003 Quarterly Update , July 2003, #78922](#)

[Recovery Rates on Defaulted Corporate Bonds and Preferred Stocks, 1982-2003, December 2003, #80272](#)

[The Performance Of Moody's Corporate Bond Ratings: January 2004 Quarterly Update, January 2004, #80988](#)

[Default & Recovery Rates of Corporate Bond Issuers, 1920-2003, January 2004, #80989](#)

### Structured Finance Special Reports:

[Moody's Approach to Rating Multisector CDOs, September 2000, #SF9050](#)

[Responses to Frequently Asked CDO Questions \(Second of Series\), July 2001, #SF10870](#)

[CMBS: Smoothing Recoveries of Servicer Advances to Minimize Interest Shortfalls, July 2003, #SF24762](#)

[Moody's Approach to Rating Synthetic Resecuritizations, October 2003, #SF27650](#)

*To access any of these reports, click on the entry above. Note that these references are current as of the date of publication of this report and that more recent reports may be available. All research may not be available to all clients.*

PAGE INTENTIONALLY LEFT BLANK

To order reprints of this report (100 copies minimum), please call 1.212.553.1658.  
Report Number: 88692

| <b>Author</b>  | <b>Editor</b>         | <b>Associate Analyst</b> | <b>Senior Production Associate</b> |
|----------------|-----------------------|--------------------------|------------------------------------|
| <i>Jian Hu</i> | <i>Michael D'Arcy</i> | <i>Alexandra Neely</i>   | <i>Mark A. Lee</i>                 |

© Copyright 2004, Moody's Investors Service, Inc. and/or its licensors including Moody's Assurance Company, Inc. (together, "MOODY'S"). All rights reserved. **ALL INFORMATION CONTAINED HEREIN IS PROTECTED BY COPYRIGHT LAW AND NONE OF SUCH INFORMATION MAY BE COPIED OR OTHERWISE REPRODUCED, REPACKAGED, FURTHER TRANSMITTED, TRANSFERRED, DISSEMINATED, REDISTRIBUTED OR RESOLD, OR STORED FOR SUBSEQUENT USE FOR ANY SUCH PURPOSE, IN WHOLE OR IN PART, IN ANY FORM OR MANNER OR BY ANY MEANS WHATSOEVER, BY ANY PERSON WITHOUT MOODY'S PRIOR WRITTEN CONSENT.** All information contained herein is obtained by MOODY'S from sources believed by it to be accurate and reliable. Because of the possibility of human or mechanical error as well as other factors, however, such information is provided "as is" without warranty of any kind and MOODY'S, in particular, makes no representation or warranty, express or implied, as to the accuracy, timeliness, completeness, merchantability or fitness for any particular purpose of any such information. Under no circumstances shall MOODY'S have any liability to any person or entity for (a) any loss or damage in whole or in part caused by, resulting from, or relating to, any error (negligent or otherwise) or other circumstance or contingency within or outside the control of MOODY'S or any of its directors, officers, employees or agents in connection with the procurement, collection, compilation, analysis, interpretation, communication, publication or delivery of any such information, or (b) any direct, indirect, special, consequential, compensatory or incidental damages whatsoever (including without limitation, lost profits), even if MOODY'S is advised in advance of the possibility of such damages, resulting from the use of or inability to use, any such information. The credit ratings and financial reporting analysis observations, if any, constituting part of the information contained herein are, and must be construed solely as, statements of opinion and not statements of fact or recommendations to purchase, sell or hold any securities. **NO WARRANTY, EXPRESS OR IMPLIED, AS TO THE ACCURACY, TIMELINESS, COMPLETENESS, MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OF ANY SUCH RATING OR OTHER OPINION OR INFORMATION IS GIVEN OR MADE BY MOODY'S IN ANY FORM OR MANNER WHATSOEVER.** Each rating or other opinion must be weighed solely as one factor in any investment decision made by or on behalf of any user of the information contained herein, and each such user must accordingly make its own study and evaluation of each security and of each issuer and guarantor of, and each provider of credit support for, each security that it may consider purchasing, holding or selling.

MOODY'S hereby discloses that most issuers of debt securities (including corporate and municipal bonds, debentures, notes and commercial paper) and preferred stock rated by MOODY'S have, prior to assignment of any rating, agreed to pay to MOODY'S for appraisal and rating services rendered by it fees ranging from \$1,500 to \$2,300,000. Moody's Corporation (MCO) and its wholly-owned credit rating agency subsidiary, Moody's Investors Service (MIS), also maintain policies and procedures to address the independence of MIS's ratings and rating processes. Information regarding certain affiliations that may exist between directors of MCO and rated entities, and between entities who hold ratings from MIS and have also publicly reported to the SEC an ownership interest in MCO of more than 5%, is posted annually on Moody's website at [www.moody.com](http://www.moody.com) under the heading "Shareholder Relations — Corporate Governance — Director and Shareholder Affiliation Policy."

| Contact                | Phone          |
|------------------------|----------------|
| <b><u>New York</u></b> |                |
| Jian Hu                | 1.212.553.1653 |
| Richard Cantor         |                |
| Nicolas Weill          |                |
| Joseph Snailer         |                |
| Tad Philipp            |                |
| Gus Harris             |                |
| Frederic Drevon        |                |

## Default & Loss Rates of Structured Finance Securities: 1993-2004

### Summary Opinion

This *Special Comment* presents Moody's third annual study of the default and loss rates of structured finance securities. This year's study is the most comprehensive to date, covering structured securities issued in all sectors and regions. Highlights of the study include:

- The number of newly impaired tranches declined to 236 in 2004 from 260 in 2003, as the decline in the number of US ABS and global CDO impairments more than offset an increase in the number of US CMBS impairments.<sup>1</sup> As a result, the one-year impairment rate of all structured finance securities fell to 1.2% in 2004 from 1.6% in 2003, while the one-year impairment rate of speculative-grade structured finance securities moved down to 6.3% from 7.7% and fell to 0.4% from 0.7% for investment-grade securities.
- Since 1993, 1,051 tranches from 580 structured finance deals have become impaired, representing 3.1% of the 34,451 tranches, 5.3% of the 10,852 deals, or 0.6% of the \$4.9 trillion worth of securities covered by the study.
- For the structured finance universe as a whole, estimated five-year cumulative loss rates have been low — only 40 basis points of the total rated volume at origination. Most structured finance securities are rated either Aaa or Aa (89% of the total rated volume), and have averaged only a four basis point five-year loss rate from origination. Loss rates for the lower rating categories have been substantially higher — 2.7% for single-A and Baa rated tranches and 9.9% for tranches rated Ba or below. (See Figure 1.)
- Loss rates are systematically higher for lower-rated tranches than for higher-rated tranches, based both on their ratings at origination and ratings at dates when seasoned cohorts are formed.<sup>2</sup> Aaa-rated structured securities have generally performed as expected, similarly to corporate Aaa-rated securities. Average loss rates for other rating categories have been higher than both historical loss rates in the corporate sector and Moody's structured finance idealized loss rates.
- The number of newly impaired US ABS securities decreased to 143 in 2004 from 161 in 2003, and fell to 41 from 68 in global CDOs. Consequently, one-year impairment rates declined to 2.1% from 2.9% for US ABS and to 1.1% from 2.5% for global CDOs. Securities backed by manufactured housing loans, aircraft and equipment leases accounted for 81% of all newly impaired US ABS securities, while securitization CDOs made up 63% of all newly impaired CDOs in 2004.
- The US CMBS sector recorded 42 newly impaired tranches in 2004, 32 of which were backed by conduit loans. By comparison, 25 were impaired in 2003 and only nine of them were conduit CMBS tranches. As a result, the US CMBS one-year impairment rate rose to 1.5% from 1.0% in 2003.

1. Material impairments (or impairments) in structured finance include uncured payment defaults or securities downgraded to Ca or C. Payment defaults include shortfalls of interest or losses of principal.

2. Cohort ratings are measured on a given date, typically at the beginning of a calendar year. Rating cohorts are formed by grouping all securities of the same rating — both newly issued and seasoned securities — outstanding on that date regardless of their origination year. Original ratings are ratings assigned at origination.

- The US RMBS sector continues to outperform all other sectors as its one-year impairment rate remains at 0.2% as it was in 2003. Prior to 2000, when most of the RMBS impairments occurred, RMBS impairments often involved transactions backed with subprime collateral. More recent impairments have included re-securitized RMBS and RMBS backed by Alt-A mortgage loans.
- Structured finance securities issued outside the US (excluding CDOs) have also experienced better than average performance. Since 1993, only two tranches have become impaired in Europe, three in Latin America, and none in the Asia-Pacific region. These represent a tiny 0.1% of all 4,514 tranches studied in this sector.
- Almost 20% of all payment defaults have ultimately been cured, with many cured payment defaults occurring in the CMBS sector. Interest defaults are more likely to be cured than defaults stemming from principal losses. Of the 207 cured defaults, 202 were related to interest shortfalls, while five were related to principal losses. The median number of months from initial default date to cure date varied from one month for RMBS and HEL, two months for CMBS, four months for ABS, to 18 months for CDOs.
- Most impaired US ABS and RMBS tranches have at some point experience loss of principal, with 71.6% of impaired ABS and 100% of impaired RMBS experiencing principal losses. Conversely, most impaired CMBS and CDO tranches have experienced only interest shortfalls, roughly 73% for CMBS and 86% for CDOs. In the aggregate, interest shortfalls are the leading reason for default among all structured finance securities, although principal loss typically outweighs interest shortfall in these securities' final loss severity.

Figure 1

**Distribution of Total Original Balances of Structured Finance Securities Rated by Moody's and Estimated Five-Year Cumulative Loss Rates by Rating at Origination, 1993-2004**

| Rating at Origination | Share of Total Original Tranche Balance Rated by Moody's | Estimated Five-Year Cumulative Loss Rates (% of original balances in each rating category)* |
|-----------------------|--|---|
| Aaa                   | 83.0%  | 0.01%   |
| Aa                    | 6.2%   | 0.4%  |
| A                     | 6.3%   | 1.3%  |
| Baa                   | 3.7%   | 5.3%  |
| Ba                    | 0.6%   | 8.4%  |
| B                     | 0.2%   | 16.4%   |
| Aaa/Aa                | 89.2%  | 0.04%   |
| A/Baa                 | 10.0%  | 2.7%  |
| Ba and below          | 0.8%   | 9.9%  |
| All Ratings           | 100%   | 0.4%  |

\* Loss rates are calculated by multiplying cumulative material impairments rates by estimated cumulative LGD rates for each original rating category. LGD rates are model-derived for RMBS/HEL securities and CDOs. LGD rates for other sectors are averages of those derived for these two sectors.

### **Moody's Structured Finance Default Risk Service**

The data underpinning the research in this default study are available in *Moody's Structured Finance Default Risk Service* (SF DRS). The database includes the credit histories of nearly 40,000 structured finance securities involving over 13,000 transactions globally in asset-backed, residential mortgage-backed, commercial mortgage-backed securities and collateralized debt obligations since 1983. The service provides the raw data to calculate rating transition and material impairment rates for the Moody's-rated structured finance universe. For more information about our SF DRS database, please call Norm Stewart in New York at (212) 553-4877 or Pasquale Manganella in London at (44 20) 7772-5549.

PAGE INTENTIONALLY LEFT BLANK

---



---

# TABLE OF CONTENTS

---

|  |    |
|--|----|
| Historical Review of Structured Finance Material Impairments .....   | 6  |
| Distribution of All Structured Finance Impairments by Sector .....   | 8  |
| Distribution of Material Impairments by Payment Default and Ca or C Rating Status .....  | 8  |
| Distribution of Payment Defaults by Loss or Shortfall Event Experienced.....   | 9  |
| Distribution of Material Impairments by Origination Year.....  | 10 |
| Distribution of Material Impairments by Original Rating.....   | 11 |
| Review of New Structured Finance Material Impairments in 2004.....   | 12 |
| Annual Impairment Rate Declined in Most Sectors .....  | 12 |
| US ABS Impairments Fell Slightly.....  | 13 |
| US CMBS Impairments Saw Slight Rise .....  | 14 |
| US RMBS Impairments Remained Negligible.....   | 14 |
| Global CDO Impairments Improved Substantially.....   | 15 |
| Non-US Non-CDO Structured Finance Impairments Few in Number .....  | 15 |
| Multi-Year Cumulative Material Impairment Rates by Rating .....  | 16 |
| Average Multi-Year Cumulative Impairment Rates by Rating .....   | 16 |
| Comparing Cumulative Impairment Rates by Cohort and Original Rating.....   | 18 |
| Comparing Cumulative Impairment Rates across Sectors .....   | 19 |
| Loss Severity Rates Given Default and Cumulative Loss Rates .....  | 21 |
| Descriptive Statistics for the Percentages of Interest Shortfalls and Principal Losses<br>to Date for Impaired ABS, CMBS and RMBS Securities ..... | 21 |
| Estimated Final Loss Severity Rates in RMBS and HEL.....   | 22 |
| Estimated Final Loss Severity Rates in CDOs.....   | 22 |
| Multi-Year Cumulative Loss Rates by Rating.....  | 23 |
| Related Research .....   | 25 |
| Appendix 1: Impairment Rates Methodology .....   | 26 |
| How to Calculate Multi-Year Cumulative Impairment Rates by Cohort Rating .....   | 26 |
| How to Calculate Multi-Year Cumulative Impairment Rates by Original Rating .....   | 27 |
| Appendix 2: LGD Rates Methodology .....  | 29 |
| Revisiting LGD Projection Model for RMBS/HEL .....   | 29 |
| Analyzing Loss Severity Rates and Time from Origination to Initial Default .....   | 30 |
| Estimating Multi-Year Cumulative LGD Rates.....  | 31 |
| Appendix 3: Impairment Rates and Loss Rates by Sector and Rating .....   | 32 |
| Figure 30 – Multi-Year Cumulative Impairment Rates by Sector and by<br>Cohort Rating, 1994-2004.....   | 32 |
| Figure 31 – Multi-Year Cumulative Impairment Rates by Sector and by<br>Original Rating, 1993-2004 .....  | 35 |
| Figure 32 – Estimated Multi-Year Cumulative Loss Rates by Sector and by<br>Cohort Rating, 1994-2004.....   | 38 |
| Figure 33 – Estimated Multi-Year Cumulative Loss Rates by Sector and by<br>Original Rating, 1993-2004 .....  | 40 |
| Figure 34 – Global Corporate Cumulative Loss Rates by Cohort Rating, 1982-2004....   | 42 |
| Figure 35 – Moody’s Idealized Loss Rates Table .....   | 42 |
| Appendix 4 – A Complete List of New Materially Impaired Structured Finance Securities in 2004 .  | 43 |
| Appendix 5 – A Complete List of Non-US Materially Impaired Structured Finance Securities,<br>1993-2004 .....                                       | 51 |



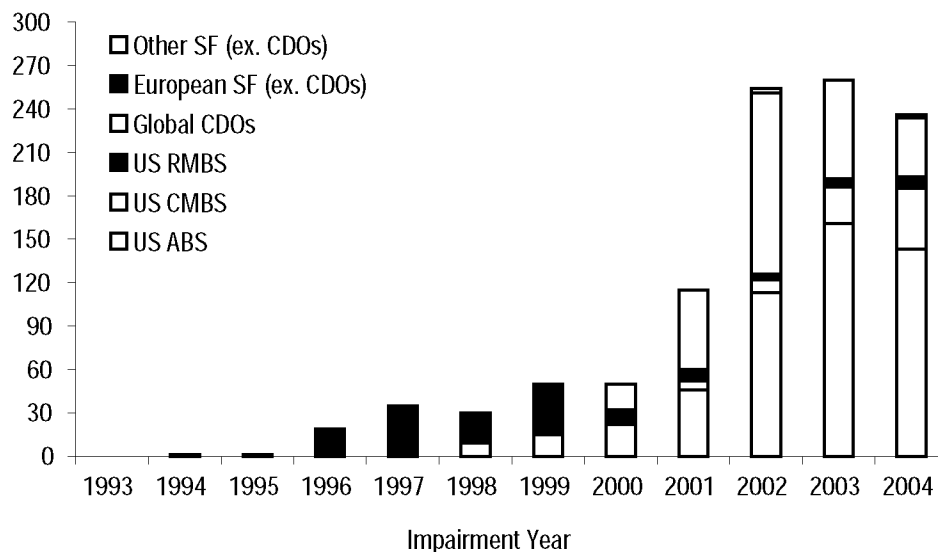
## Historical Review of Structured Finance Material Impairments

The credit performance of structured finance securities generally improved on a global basis in 2004, compared to both 2002 and 2003, as both the US ABS and global CDO sectors improved. The total number of new materially impaired tranches — defaulted tranches that remained uncured or tranches downgraded to Ca or C — declined by 9%, to 236 in 2004 from 260 in 2003. Figure 2 shows that the decline in the number of new impairments was concentrated in the US ABS and global CDO sector, and the total number of newly impaired US ABS securities remained high in 2004; meanwhile, the number of newly impaired tranches in the US CMBS sector increased, and the US RMBS sector continued to experience few impairments in 2004.

The structured finance sectors outside the United States excluding CDOs have performed very well. Only two tranches in Europe, three in Latin America, and none in the Asia-Pacific region were impaired during the entire period of study.

Figure 2

### Number of New Materially Impaired Tranches



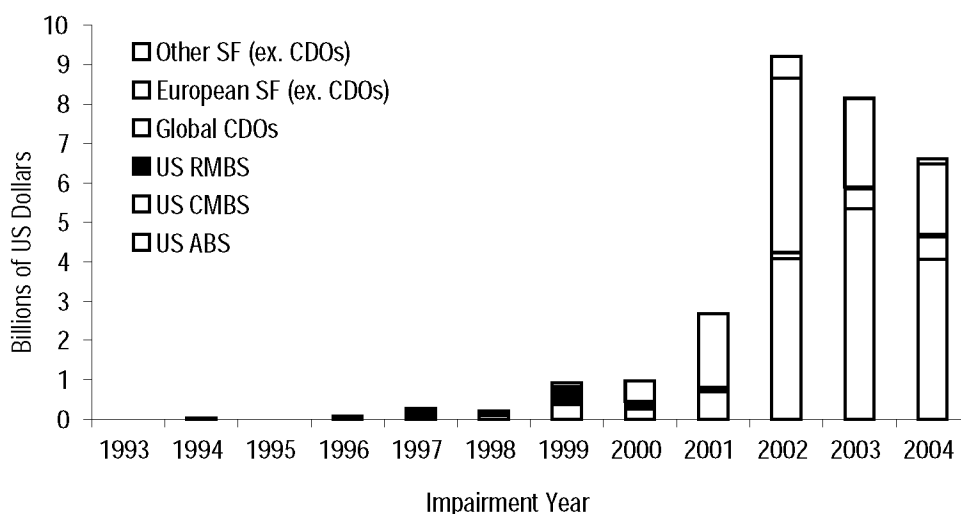
Notes on the data sample:

1. US and international CDOs are grouped into one category – Global CDOs.
2. European SF (ex. CDOs) includes all European structured finance securities excluding CDOs.
3. Other SF (ex. CDOs) includes structured finance ratings rated in regions other than US and Europe, also excluding CDOs.
4. US RMBS includes securities backed by prime jumbo and Alt-A mortgage loans and resecutitized RMBS. Some RMBS issued in the early and middle 1990s used non-prime mortgages as collateral.
5. Home-equity-loan- (HEL-) backed securities are included in the US ABS sector.
6. Tranches with long-term ratings issued between 1993 and 2004 are included.
7. Pari passu tranches are collapsed into a single tranche. Tranches guaranteed by financial guarantors or government-sponsored-enterprises (GSEs), repackaged securities, structured notes, structured investment vehicles, structured covered bonds, and other credit derivative securities are not included.

The total original balance of newly impaired tranches shrank sharply in 2004 by 17% to \$6.5 billion from \$7.8 billion in 2003. Figure 3, however, reveals that the peak in impairments occurred in 2002 when measured by their original balances.

Figure 3

### Total Original Balances of New Materially Impaired Tranches



Note: The notes listed for Figure 2 also apply here.

While the number and dollar volume of new impairments in structured finance have been declining, the total number and dollar volume of outstanding tranches has been markedly increasing. Figure 4 shows that the number of outstanding structured finance ratings rose 24% during 2003 and 35% during 2004 — the highest growth rate observed since 1995.

Rapid growth was particularly evident in the mortgage-backed securities (MBS) sector, which includes HEL, RMBS and CMBS. In 2004, the number of HEL ratings grew by a staggering 77%, while the number of US RMBS and CMBS ratings grew 43% and 21%, respectively. Altogether, the MBS sector saw the number of its ratings grow by 49% to 15,835 at the end of 2004, representing roughly 57% of all structured ratings outstanding.

Figure 4

### Number of Outstanding Ratings at the End of Each Year

| sector                 | 1993 | 1994  | 1995  | 1996  | 1997  | 1998  | 1999  | 2000  | 2001   | 2002   | 2003   | 2004   |
|------------------------|------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|
| US ABS                 | 163  | 415   | 793   | 1,224 | 1,845 | 2,519 | 3,107 | 3,714 | 4,468  | 5,517  | 6,937  | 9,993  |
| US CMBS                | 67   | 118   | 145   | 197   | 358   | 638   | 1,008 | 1,351 | 1,916  | 2,464  | 2,896  | 3,496  |
| US RMBS                | 527  | 1,084 | 1,642 | 1,870 | 2,038 | 2,104 | 2,113 | 2,134 | 2,643  | 3,633  | 4,025  | 5,750  |
| Global CDOs            | 4    | 9     | 23    | 75    | 182   | 398   | 811   | 1,280 | 1,934  | 2,710  | 3,693  | 4,658  |
| European SF (ex. CDOs) | 8    | 23    | 59    | 109   | 176   | 291   | 438   | 648   | 943    | 1,282  | 1,666  | 2,036  |
| Other SF (ex. CDOs)    | 10   | 18    | 24    | 41    | 80    | 123   | 256   | 482   | 710    | 963    | 1,286  | 1,658  |
| All Structured Finance | 779  | 1,667 | 2,686 | 3,516 | 4,679 | 6,073 | 7,733 | 9,609 | 12,614 | 16,569 | 20,503 | 27,591 |

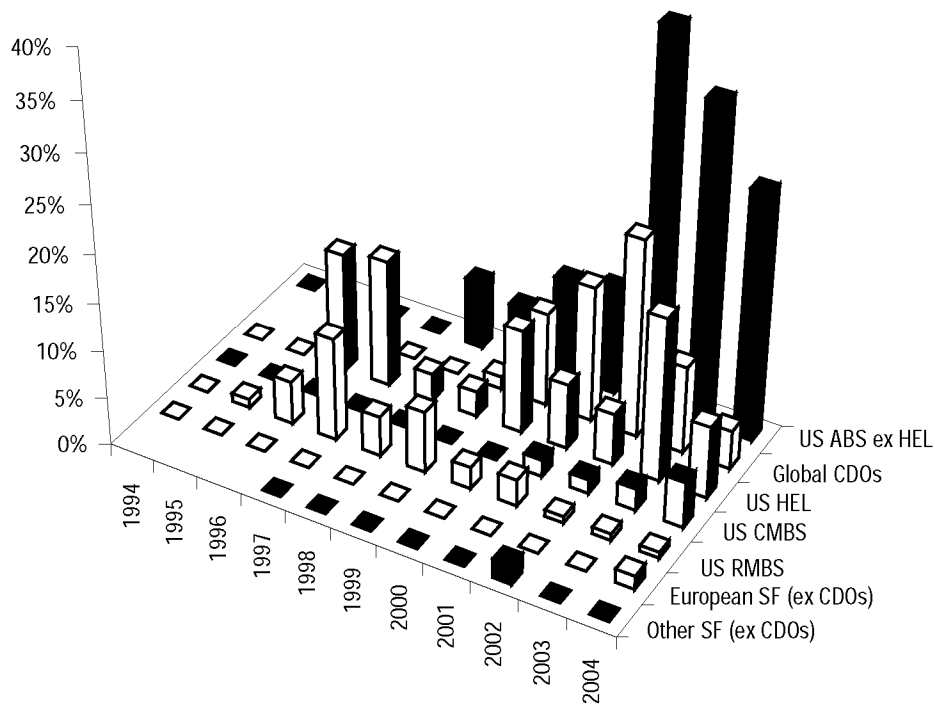
Note: See notes for Figure 2 concerning the data sample and sector definitions.

Declining impairments, coupled with strong growth in the number of outstanding ratings, drove the one-year impairment rate — the number of newly impaired ratings as a percentage of the total ratings outstanding at the beginning of each year — down to 1.2% in 2004, from 1.6% in 2003 and 2.0% in 2002. Within the speculative-grade category, which includes securities rated Ba, single-B or Caa, the one-year impairment rate fell to 6.3% in 2004 from 7.7% in 2003, and within the investment-grade category, it went down to 0.4% from 0.7%.

Figure 5 further depicts historical trends for speculative-grade one-year impairment rates by structured finance sector. It shows clear improvements in the US ABS, HEL and global CDOs sectors in 2004 compared with 2003, continuing outstanding performance in the US RMBS sector, and a moderate increase in new impairments in the US CMBS sector.

Figure 5

### Speculative-Grade One-Year Material Impairment Rates by Sector



The rest of this report is organized as follows. We first analyze the distribution of payment defaults and material impairments by reason for impairment, credit events experienced, cure status, and Ca or C rating status. We then examine their distribution by origination year (vintage) and by rating at origination. Next, we review new structured finance impairments in 2004 by sector and compare multi-year cumulative impairment rates by cohort rating and original rating. Finally, we discuss loss severity (LGD) rates, and cumulative loss rates. Appendices 1 and 2 explain Moody's methodologies on the calculation of cumulative material impairment rates and LGD rates. Appendix 3 presents cumulative impairment rates and cumulative loss rates data by sector and time horizon. Appendices 4 and 5 provide a complete list of structured finance securities newly impaired in 2004 and a list of all materially impaired structured finance securities outside the United States.

## Distribution of All Structured Finance Impairments by Sector

### *Distribution of Material Impairments by Payment Default and Ca or C Rating Status*

During the sample period between 1993 and 2004, a total of 1,051 tranches from 580 structured finance deals became impaired. This represents roughly 3.1% of the 34,451 structured finance tranches and 5.3% of the 10,852 deals studied. Of all dollar-denominated structured finance tranches, roughly 0.6% of the \$4,873 billion worth of tranches (by their original balance) studied became impaired. (See notes to Figure 2 concerning the data sample.)

The US ABS sector recorded the greatest number of impairments, affecting 513 tranches from 243 deals.<sup>3</sup> The global CDO sector saw 309 impairments from 192 deals. In the US RMBS and CMBS sectors, 141 tranches from 91 deals and 83 tranches from 49 deals became impaired, respectively. A distribution of all impaired securities by their payment default and Ca or C rating action status by sector is shown in Figure 6.

3. 96 of these are impaired HEL securities.

Figure 6

**Distribution of Material Impairments by Payment Default and Ca or C Rating Status, 1993-2004**

|  | Row Number  | US ABS | US CMBS | US RMBS | Global CDOs | European SF (ex. CDOs) | Other SF (ex. CDOs) | All Structured Finance |
|--|-------------|--------|---------|---------|-------------|------------------------|---------------------|------------------------|
| Payment Defaults                               | (1)=(2)+(3) | 405    | 220     | 163     | 299         | 1                      | 1                   | 1089                   |
| Cured Defaults                                 | (2)         | 18     | 138     | 23      | 27          | 0                      | 1                   | 207                    |
| Uncured Defaults                               | (3)         | 387    | 82      | 140     | 272         | 1                      | 0                   | 882                    |
| Rated Ca /C                                    | (4)=(5)+(6) | 427    | 32      | 65      | 211         | 1                      | 9                   | 745                    |
| Rated Ca or C but upgraded or paid in full     | (5)         | 3      | 1       | 0       | 2           | 0                      | 6                   | 12                     |
| Rated Ca or C not upgraded or not paid in full | (6)=(7)+(8) | 420    | 31      | 63      | 209         | 1                      | 3                   | 727                    |
| Rated Ca or C not in default                   | (7)         | 126    | 1       | 1       | 37          | 1                      | 3                   | 169                    |
| Rated Ca or C in default and uncured           | (8)         | 298    | 30      | 64      | 172         | 0                      | 0                   | 564                    |
| Material Impairments                           | (9)=(3)+(7) | 513    | 83      | 141     | 309         | 2                      | 3                   | 1051                   |

Note: See notes for Figure 2 concerning the data sample and sector definitions.

The data in Figure 6 has three notable implications:

First, payment defaults are sometimes cured, and cure rates vary across sectors. (See Row (2) of Figure 6.) The US CMBS sector experienced a total of 220 payment defaults — due either to missed interest payments or lost principals. Of these, 138, or 62.7%, were cured — the highest cure rate among all the sectors.<sup>4</sup> By contrast, the US ABS sector had the lowest cure rate — only 18 of 405 payment defaults have been cured.<sup>5</sup> The cure rate of CDO payment defaults, which were primarily due to interest deferrals or PIKing (payment-in-kind), was at 9.0%, suggesting that most CDO payment defaults remain materially impaired.<sup>6</sup>

Second, about 63% of all currently uncured payment defaults have been downgraded to Ca or C (Row (8) divided by Row (3)), suggesting high expected loss severity rates for these tranches, but 37% carried a rating higher than Ca. In fact, among those uncured payment defaults that were not downgraded to Ca or C and were still outstanding at year-end 2004, 201, or 83% of the total 243 such securities, were rated Ba, single-B, or Caa. For those that remained uncured and rated Baa or above, some were downgraded or placed on watch for downgrades in the first half of 2005, while others are expected to be cured.

The percentages of Ca- or C-rated and uncured defaults also vary markedly across sectors. The US ABS sector is the highest with 76%, and the CDO sector is the second highest with 63%. The percentages are lower in the US RMBS and CMBS sectors with 44% and 37%, respectively. Conversely, the percentages of uncured defaults that were not downgraded to Ca or C are higher in RMBS and CMBS than in ABS and CDOs.

Third, a substantial proportion of the Ca- or C-rated securities have not yet experienced a payment default. In the US ABS sector, there were 126 such securities, roughly 30% of all Ca- or C-rated securities in the sector. The percentage was 17.5% in the global CDO sector, but less than 5% in the US RMBS and CMBS sectors. This implies that the number of payment defaults is likely to increase in the US ABS and CDO sectors.

### ***Distribution of Payment Defaults by Loss or Shortfall Event Experienced***

Moody's defines a tranche as being in payment default when it experiences interest shortfalls or principal losses.<sup>7</sup> Defaults resulting from interest problems are more likely to be cured than defaults resulting from principal losses. Of the 207 cured defaults, 202 missed or deferred interests while five had principal losses.

Principal losses were much more prevalent among uncured defaults. Of all 882 uncured defaults, 543 experienced interest shortfalls while 477 had principal losses. We summarize these findings in Figure 7.

4. Among cured CMBS defaults, the average number of months from the initial default date to the cured date is 4.1 and the median is two. Nine CMBS defaults were cured after 12 months from the initial default date.

5. Among cured ABS defaults, the average number of months from the initial default rate to the cure date is 7.8 and the median is four. Only three ABS defaults were cured after 12 months from the initial default date. By comparison, among cured RMBS and HEL defaults, the average is 3.4 and the median is one.

6. 24 of the 27 cured CDO tranches were cured within two years after the initial default date. The longest duration from default to cure is 42 months (14 quarterly payment periods). Among cured CDOs, the average number of months from default to cure is 17 and the median is 18. Note that the typical payment frequency of CDOs is quarterly or semi-annually, whereas that of ABS and MBS is monthly.

7. This definition — along with the addition of securities rated Ca or C discussed above — parallels the definition of credit events currently being used in many "pay-as-you-go" ABS credit default swaps. We do not track, however, one type of credit events — called "implied writedowns". An implied writedown occurs whenever a securitization's tranche balances at or above a given tranche total to more than its collateral pool balance. In this report, we do not track implied writedowns as material impairment events, but if they are not cured, they inevitably will lead to future missed payments and/or explicit principal writedowns (realized principal losses), which we do track. Finally, for the frequencies of rating transitions into the Caa or below category among Moody's rated structured finance securities worldwide, see "Structured Finance Rating Transitions: 1983-2004," Moody's Special Comment, February 2005.

Figure 7

**Distribution of Payment Defaults by Loss or Shortfall Event Experienced, 1993-2004****Cured Payment Defaults**

| Sector                 | Total Number of Tranches | Tranches experienced interest shortfalls | Tranches experienced principal losses | Tranches experienced both interest shortfalls & principal losses | Tranches experienced only interest shortfalls, and no principal losses | Tranches experienced only principal losses, and no interest shortfalls |
|------------------------|--------------------------|--|---------------------------------------|--|--|--|
| US ABS                 | 18                       | 16                                       | 2                                     | 0  | 16   | 2  |
| US CMBS                | 138                      | 136                                      | 2                                     | 0  | 136  | 2  |
| US RMBS                | 23                       | 22                                       | 1                                     | 0  | 22   | 1  |
| Global CDOs            | 27                       | 27                                       | 0                                     | 0  | 27   | 0  |
| European SF (ex. CDOs) | 0                        | 0  | 0                                     | 0  | 0  | 0  |
| Other SF (ex. CDOs)    | 1                        | 1  | 0                                     | 0  | 1  | 0  |
| All Structured Finance | 207                      | 202                                      | 5                                     | 0  | 202  | 5  |

**Uncured Payment Defaults**

| Sector                 | Total Number of Tranches | Tranches experienced interest shortfalls | Tranches experienced principal losses | Tranches experienced both interest shortfalls & principal losses | Tranches experienced only interest shortfalls, and no principal losses | Tranches experienced only principal losses, and no interest shortfalls |
|------------------------|--------------------------|--|---------------------------------------|--|--|--|
| US ABS                 | 387                      | 181                                      | 297                                   | 91   | 90   | 206  |
| US CMBS                | 82                       | 81                                       | 22                                    | 21   | 60   | 1  |
| US RMBS                | 140                      | 26                                       | 140                                   | 26   | 0  | 114  |
| Global CDOs            | 272                      | 255                                      | 38                                    | 21   | 234  | 17   |
| European SF (ex. CDOs) | 1                        | 0  | 1                                     | 0  | 0  | 1  |
| Other SF (ex. CDOs)    | 0                        | 0  | 0                                     | 0  | 0  | 0  |
| All Structured Finance | 882                      | 543                                      | 498                                   | 159  | 384  | 339  |

Note: Interest shortfalls in the CDO sector include interest deferrals and PIKing.  
See notes for Figure 2 concerning the data sample and sector definitions.

Across the various sectors, the number of interest-shortfall defaults and principal-loss defaults varied markedly. Most of the uncured US ABS and RMBS defaults lost principal – 277 out of 387, or 71.6% for ABS, and 140 out of 140, or 100% for RMBS. Conversely, most of the uncured CMBS and CDOs defaults were only interest related, 60 out of 82, or 73%, for CMBS and 234 out of 272, or 86%, for CDOs. Consequently, interest shortfalls are the leading reason for default among all structured finance securities, although in the last section of this study we show that principal loss typically outweighs interest shortfall in these securities' final loss severity.

***Distribution of Material Impairments by Origination Year***

Impairments in structured finance have so far been concentrated in deals originated between 1997 and 2001, in other words, those that have seasoned for three to seven years as of year-end 2004. Deals originated after 2001 experienced only 43 impairments. However, these recent deals may experience more impaired tranches once they become more seasoned.<sup>8</sup>

8. We have documented previously that, in addition to being influenced by macro-economic factors, impairment rates exhibit strong seasoning patterns, peaking between the third and sixth years after origination. Please refer to "Default & Loss Rates of Structured Finance Securities: 1993-2003," Moody's Special Comment, September 2004.

Figure 8

**Distribution of All Material Impairments by Origination Year (Vintage), 1993 – 2004**

|              | US ABS     | US CMBS   | US RMBS    | Global CDOs | Europe SF (ex. CDOs) | Other SF (ex. CDOs) | All Structured Finance |
|--------------|------------|-----------|------------|-------------|----------------------|---------------------|------------------------|
| 1993 vintage | 5          | 1         | 25         |             |                      |                     | 31                     |
| 1994 vintage | 17         |           | 46         |             |                      |                     | 63                     |
| 1995 vintage | 22         |           | 36         | 1           |                      |                     | 59                     |
| 1996 vintage | 42         | 2         | 20         | 10          |                      | 1                   | 75                     |
| 1997 vintage | 72         | 6         | 5          | 35          |                      |                     | 118                    |
| 1998 vintage | 91         | 13        | 3          | 55          |                      |                     | 162                    |
| 1999 vintage | 77         | 16        |            | 88          |                      |                     | 181                    |
| 2000 vintage | 95         | 27        |            | 69          | 1                    | 1                   | 193                    |
| 2001 vintage | 62         | 16        | 2          | 45          |                      | 1                   | 126                    |
| 2002 vintage | 26         | 1         | 4          | 6           | 1                    |                     | 38                     |
| 2003 vintage | 4          | 1         |            |             |                      |                     | 5                      |
| 2004 vintage | 0          | 0         | 0          | 0           | 0                    | 0                   | 0                      |
| <b>Total</b> | <b>513</b> | <b>83</b> | <b>141</b> | <b>309*</b> | <b>2</b>             | <b>3</b>            | <b>1051</b>            |

\*Note: Of these, 21 are European CDOs and the rest are US CDOs.  
See notes for Figure 2 concerning the data sample and sector definitions.

By sector, US ABS and global CDOs were similar to structured finance as a whole with regard to their impairment distribution by vintage, while the distributions in the RMBS and CMBS sectors showed significant differences – most of the RMBS impairments occurred in 1993-1996 vintages while most CMBS impairments occurred in 1998-2001 vintages.

### ***Distribution of Material Impairments by Original Rating***

By original rating, the Baa rating category was the most impaired rating category, making up more than 40% of all impairments (Figure 9). This is not only true for all structured finance as a whole, but also for each sector except US CMBS, in which the single-B category was the most impaired. In addition, most single-A, Aa and Aaa-rated tranches that became impaired were in the US ABS sector.

Figure 9

**Distribution of All Material Impairments by Original Rating, 1993 – 2004**

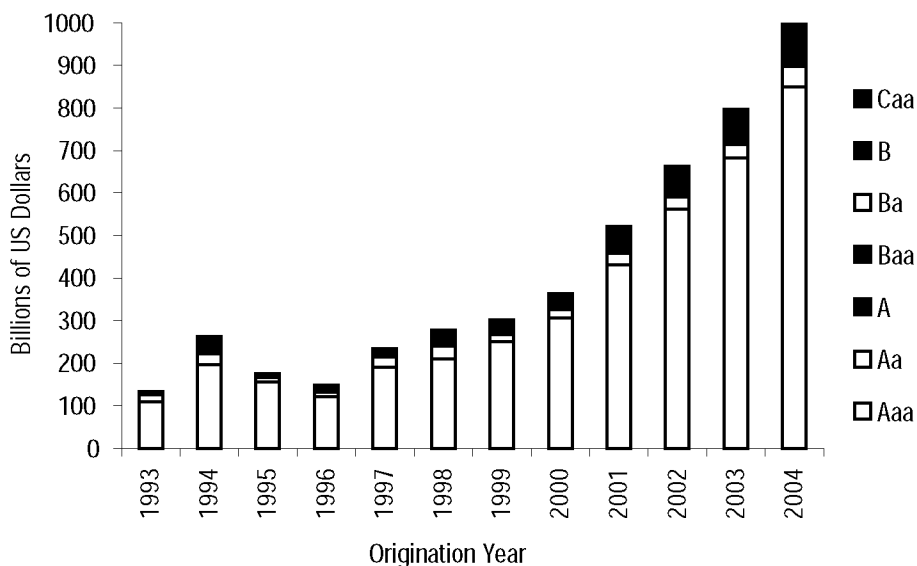
| Sector   | Original Rating |       |       |       |       |       |       | Total  |
|--|-----------------|-------|-------|-------|-------|-------|-------|--------|
|  | Aaa             | Aa    | A     | Baa   | Ba    | B     | Caa   |        |
| US ABS   | 17              | 73    | 79    | 203   | 108   | 32    | 1     | 513    |
| US CMBS  | 0               | 0     | 3     | 12    | 11    | 48    | 9     | 83     |
| US RMBS  | 9               | 9     | 7     | 61    | 26    | 29    | 0     | 141    |
| Global CDOs  | 0               | 10    | 24    | 151   | 82    | 42    | 0     | 309    |
| Europe SF (ex. CDOs)   | 0               | 0     | 0     | 1     | 1     | 0     | 0     | 2      |
| Other SF (ex. CDOs)  | 0               | 0     | 2     | 0     | 1     | 0     | 0     | 3      |
| All Structured Finance Impairments (by number of securities)                     | 26              | 92    | 115   | 428   | 229   | 151   | 10    | 1051   |
| Total Number of Structured Finance Securities (excluding 2004 deals)             | 7836            | 4442  | 5621  | 5577  | 1926  | 933   | 37    | 26372  |
| Lifetime Impairment Rate (by number of securities)                               | 0.3%            | 2.1%  | 2.0%  | 7.7%  | 11.9% | 16.2% | 27.0% | 4.0%   |
| Total Dollar Volume of Impaired Securities (by original balance, \$ billions)    | 3.9             | 4.0   | 3.7   | 11.0  | 4.4   | 1.6   | 0.06  | 28.6   |
| Total Dollar Volume of Structured Securities (excluding 2004 deals, \$ billions) | 3217.5          | 238.6 | 243.4 | 143.3 | 25.5  | 8.0   | 0.6   | 3876.9 |
| Lifetime impairment rate (share of original balances)                            | 0.12%           | 1.7%  | 1.5%  | 7.7%  | 17.3% | 19.4% | 10.6% | 0.7%   |

Note: See notes for Figure 2 concerning the data sample and sector definitions.

Figure 9 also reports lifetime impairment rates by original rating, both as share of securities and as share of original balances. Lifetime impairment rates measure the impairment experiences to date (from origination) of all securities issued during 1993 and 2003.<sup>9</sup> We can see clearly that lifetime impairment rates increased as original ratings declined.

In the aggregate, the lifetime impairment rate of all structured securities was about 4.0% by number of securities, but only 0.7% when measured by original balance. These figures reflect the much better performance of the higher-rated tranches that comprise a large proportion of the total rated volume. Figure 10 plots the distribution of total original balances by original rating and origination year. It shows that the dollar volume of Aaa and Aa-rated tranches has consistently made up about 90% of the total.

Figure 10  
**Total Original Balances of All Structured Securities by Origination Year and Original Rating**



Note: See notes for Figure 2 concerning the data sample. This figure only includes US dollar denominated tranches.

## Review of New Structured Finance Material Impairments in 2004

### Annual Impairment Rate Declined in Most Sectors

Out of a total of 20,503 rated tranches outstanding at the beginning of 2004, 236 tranches became impaired by year end, compared with 260 newly impaired tranches in 2003. The one-year impairment rate — the number of new material impairments divided by the number of outstanding ratings at the beginning of a given year — improved to 1.2% from 1.6% in 2003.

New impairments in 2004 were concentrated in the US ABS, CMBS and global CDO sectors. Roughly 60.6% of all 2004 new impairments involved US ABS, 17.8% involved US CMBS, and 17.4% involved CDOs. Impairment rates were also higher in these three sectors than in other sectors. Nevertheless, credit performance within both the US ABS and global CDOs sectors improved. Annual impairment rates fell in 2004 compared to 2003 — down to 2.1% from 2.9% for US ABS, and down to 1.1% from 2.5% for CDOs.

The annual impairment rate of US CMBS, however, increased to 1.5% from 1.0% in 2003. Most of the 42 CMBS impairments in 2004 came from deals issued between 1999 and 2001. The impairment rate of US RMBS remained at 0.2% in 2004 as it was a year before. Figure 11 reports the distribution of new impairments by vintage and compares one-year impairment rates in 2004 and 2003.

9. We calculate lifetime impairment rates to date (by the end of 2004) for all tranches issued between 1993 and 2003. Tranches originated in 2004 are not included because with less than one-year outstanding since origination, they are not expected to experience any defaults. Including them would unnecessarily inflate the denominator. Also, by construction, lifetime impairment rates, measured to date, are less than lifetime impairment rates, measured to maturity. They are also not defined with respect to a specific time horizon after origination. Impairment rates by time horizons and original rating are analyzed in a later section.

Figure 11

**Distribution of New Material Impairments in 2004 by Sector and Vintage**

|                                  | US<br>ABS | US<br>CMBS | US<br>RMBS | Global<br>CDOs | European SF<br>(ex. CDOs) | Other SF<br>(ex. CDOs) | All Structured<br>Finance |
|----------------------------------|-----------|------------|------------|----------------|---------------------------|------------------------|---------------------------|
| 1993 vintage                     |           |            |            |                |                           |                        |                           |
| 1994 vintage                     |           |            |            |                |                           |                        |                           |
| 1995 vintage                     | 1         |            | 1          |                |                           |                        | 2                         |
| 1996 vintage                     | 2         | 2          |            | 2              |                           |                        | 6                         |
| 1997 vintage                     | 3         | 2          | 1          | 1              |                           |                        | 7                         |
| 1998 vintage                     | 16        | 3          | 1          | 5              |                           |                        | 25                        |
| 1999 vintage                     | 33        | 10         |            | 5              |                           |                        | 48                        |
| 2000 vintage                     | 32        | 14         |            | 8              | 1                         |                        | 55                        |
| 2001 vintage                     | 31        | 9          | 2          | 16             |                           |                        | 58                        |
| 2002 vintage                     | 21        | 1          | 3          | 4              | 1                         |                        | 30                        |
| 2003 vintage                     | 4         | 1          |            |                |                           |                        | 5                         |
| 2004 vintage                     |           |            |            |                |                           |                        |                           |
| Total New Impairments in 2004    | 143       | 42         | 8          | 41             | 2                         | 0                      | 236                       |
| One-Year Impairment Rate in 2004 | 2.1%      | 1.5%       | 0.2%       | 1.1%           | 0.1%                      | 0.0%                   | 1.2%                      |
| Total New Impairments in 2003    | 161       | 25         | 6          | 68             | 0                         | 0                      | 260                       |
| One-Year Impairment Rate in 2003 | 2.9%      | 1.0%       | 0.2%       | 2.5%           | 0.0%                      | 0.0%                   | 1.6%                      |

Note: See notes for Figure 2 concerning the data sample and sector definitions.

**US ABS Impairments Fell Slightly**

Most of the US ABS tranches newly impaired in 2004 involved manufactured housing, aircraft or equipment lease transactions. Manufactured housing accounted for 76 of all 143 ABS tranches impaired in 2004. The number of new MH impairments in 2004 was, however, lower than the 101 impairments experienced in 2003, resulting in a slight drop in the impairment rate to 16.7% from 18.6% impairment rate. (See Figure 12.) The number of aircraft and equipment lease ABS impairments rose notably from 5 in 2003 to 40 in 2004, causing the annual impairment rate of this ABS category to jump from 2.3% to 19.7%.

Figure 12

**Distribution of New US ABS Material Impairments in 2004 by Asset Type and Vintage**

|                                  | Auto &<br>Trucks | Credit<br>Card | Aircraft &<br>Equipment<br>Leases | Manufactured<br>Housing | Franchise<br>Loans | HEL  | Other ABS | US ABS<br>Total |
|----------------------------------|------------------|----------------|-----------------------------------|-------------------------|--------------------|------|-----------|-----------------|
| 1995 vintage                     |                  |                |                                   | 1                       |                    |      |           | 1               |
| 1996 vintage                     |                  |                | 1                                 | 1                       |                    |      |           | 2               |
| 1997 vintage                     |                  |                |                                   | 2                       |                    | 1    |           | 3               |
| 1998 vintage                     |                  |                |                                   | 11                      | 2                  | 3    |           | 16              |
| 1999 vintage                     |                  |                | 8                                 | 19                      | 3                  | 3    |           | 33              |
| 2000 vintage                     |                  |                | 12                                | 13                      | 4                  | 2    | 1         | 32              |
| 2001 vintage                     |                  |                | 9                                 | 14                      |                    | 8    |           | 31              |
| 2002 vintage                     |                  |                | 6                                 | 15                      |                    |      |           | 21              |
| 2003 vintage                     |                  |                | 4                                 |                         |                    |      |           | 4               |
| 2004 vintage                     |                  |                |                                   |                         |                    |      |           |                 |
| Total New Impairments in 2004    | 0                | 0              | 40                                | 76                      | 9                  | 17   | 1         | 143             |
| One-Year Impairment Rate in 2004 | 0.0%             | 0.0%           | 19.7%                             | 16.7%                   | 8.9%               | 0.5% | 0.1%      | 2.1%            |
| Total New Impairments in 2003    | 0                | 5              | 5                                 | 101                     | 15                 | 34   | 1         | 161             |
| One-Year Impairment Rate in 2003 | 0.0%             | 0.5%           | 2.3%                              | 18.6%                   | 13.6%              | 1.4% | 0.1%      | 2.9%            |

Note: The HEL category includes first-lien subprime mortgage, high LTV loan, home equity line of credit (HELOC), home improvement loan, and net interest margin (NIM) securitizations. The majority of the recently issued HELs are backed by first-lien subprime mortgages.

HEL new impairments contracted to 17 in 2004 from 34 in 2003, resulting in the annual impairment rate dropping to 0.5% from 1.4%. About half of the new HEL impairments in 2004 involved securities issued in 2001. Recent HEL vintages have performed better as there have been no impairments from deals issued after 2001. Most of the recent HEL deals were backed by first-lien subprime mortgages, which so far have performed well. In fact, subprime



mortgage backed HEL improved in 2004, as seven of the 17 HEL impairments in 2004 were backed by first lien sub-prime mortgage loans, but in 2003, 21 of the 34 were subprime mortgage HELs.

No tranches became impaired in the auto and credit-card ABS sectors in 2004, and only one tranche of a small-business-loan securitization became impaired.

### ***US CMBS Impairments Saw Slight Rise***

The US CMBS sector recorded more impairments in 2004 than it did in 2003, but with two notable changes in the composition of the new impairments. (See Figure 13.)

First, the distribution of ratings among newly impaired securities was different. All 42 impairments in 2004 were rated speculative-grade at origination (31 carried an initial single-B rating), whereas 12 of the 25 impairments in 2003 were rated single-A or Baa at origination.

Second, the distribution of deal types among the impairments has been different in these two years. There were no single-asset or single borrower tranche impairments in 2004, but there were five in 2003. There was one large loan impairment in 2004, but eight in 2003. In 2004 there were 32 impaired conduit tranches, but only nine in 2003. The increase in impairments in conduit CMBS securities in 2004 echoed Moody's concern in this segment of the CMBS market.<sup>10</sup>

Figure 13  
**Distribution of New US CMBS Material Impairments in 2004 and 2003 by Original Rating and Deal Type**

| Original Rating | Number of New Impairments in 2004 | Number of New Impairments in 2003 | Deal Type       | Number of Impairments in 2004 | Number of New Impairments in 2003 |
|-----------------|-----------------------------------|-----------------------------------|-----------------|-------------------------------|-----------------------------------|
| A               | 0                                 | 3                                 | Conduit         | 32                            | 9                                 |
| Baa             | 0                                 | 9                                 | Floating Rate   | 9                             | 3                                 |
| Ba              | 8                                 | 0                                 | Large Loan      | 1                             | 8                                 |
| B               | 31                                | 8                                 | Single Asset    | 0                             | 4                                 |
| Caa             | 3                                 | 5                                 | Single Borrower | 0                             | 1                                 |
|                 |                                   |                                   |                 |                               |                                   |
| Total           | 42                                | 25                                | Total           | 42                            | 25                                |

In addition, interest shortfalls are still the leading reason for default in US CMBS. Of all 32 tranches newly impaired in 2004, only two experienced principal losses, whereas in 2003 ten became impaired because of principal loss.

Of all 22 impaired CMBS securities that have ever had a principal loss, almost all (with one exception) were initially impaired because of interest shortfall, and only four were rated investment-grade — three were rated Baa originally and one was rated single-A.

### ***US RMBS Impairments Remained Negligible***

In the US RMBS sector, which includes prime jumbo, Alt-A, and resecuritized mortgage-backed securities, the number of new impairments was similar in 2004 and 2003, with eight impairments in 2004 and six in 2003. The one-year impairment rate remained at 0.2% in 2004 as it was in 2003.

Four of the eight US RMBS impairments in 2004 were resecuritized RMBS — securitizations of previously issued RMBS or HEL tranches. Three of the remaining four tranches were backed by fixed-rate first-lien loans that were of Alt-A type credit quality, and one was backed by first-lien hybrid adjustable-rate mortgages. (See Figure 14.)

Figure 14  
**Distribution of New US RMBS Material Impairments in 2004 and 2003 by Collateral Type**

|  | Number of New Impairments in 2004 | Number of New Impairments in 2003 |
|--|-----------------------------------|-----------------------------------|
| Prime RMBS   | 1                                 | 1                                 |
| Alt-A RMBS   | 3                                 | 0                                 |
| Backed by loans originated by Quality Mortgage USA, Inc. | 0                                 | 4                                 |
| Resecuritized RMBS                                       | 4                                 | 1                                 |
| <b>Total</b>   | <b>8</b>                          | <b>6</b>                          |

10. See Moody's Structured Finance Special Report, "2004 Review and 2005 Outlook: US CMBS, Record Issuance Expected but Lending 'Frothiness' Persists," January 2005.

Most impairments in the US RMBS sector during 1993-2004 have been concentrated in transactions backed by mortgage loans originated or acquired by a single mortgage lender — Quality Mortgage USA, Inc. At least 83 of the total 141 RMBS impairments during 1993-2004, or 59%, involved Quality Mortgage's loan securitizations. These mortgage loans contained high percentages of investor properties, 2-4 family properties, and loans originated with inadequate documentation. Securitizations of Quality Mortgage's loans, however, were no longer a factor in the 2004 RMBS impairments; whereas in 2003 Quality Mortgage's loans backed four of the six impaired tranches.

### ***Global CDO Impairments Improved Substantially***

New impairments of CDOs in 2004 primarily involved resecuritizations of structured securities, which comprised 26, or 63% of the 41 total newly impaired CDO tranches. Among the newly impaired resecuritizations, half were originated in 2001. By contrast, most impaired CDOs in 2003 were HY CBOs, which comprised about half of the 68 total CDO impairments in 2003.

The greater number of new impairments in resecuritization CDOs, however, was roughly offset by the greater number of outstanding resecuritization CDO ratings. This resulted in similar annual impairment rates for this CDO category in 2004 and 2003. By contrast, the annual impairment rates continued to fall for CDOs in the CBO categories — both HY CBO and IG CBOs — and for CDOs in the synthetic arbitrage category as well. (See Figure 15.)

*Figure 15*

**Distribution of New Global CDO Material Impairments in 2004 by Deal Type and Vintage**

|                                  | HY CBO | Resec | BalSh Syn | BalSh CF | IG CBO | HY CLO | MV   | Syn Arb | Other CDOs | All CDOs |
|----------------------------------|--------|-------|-----------|----------|--------|--------|------|---------|------------|----------|
| 1995 vintage                     |        |       |           |          |        |        |      |         |            | 0        |
| 1996 vintage                     | 2      |       |           |          |        |        |      |         |            | 2        |
| 1997 vintage                     | 1      |       |           |          |        |        |      |         |            | 1        |
| 1998 vintage                     | 3      | 1     |           |          |        | 1      |      |         |            | 5        |
| 1999 vintage                     | 2      | 2     |           |          |        |        | 1    |         |            | 5        |
| 2000 vintage                     |        | 6     | 2         |          |        |        |      |         |            | 8        |
| 2001 vintage                     | 1      | 13    | 1         |          | 1      |        |      |         |            | 16       |
| 2002 vintage                     |        | 4     |           |          |        |        |      |         |            | 4        |
| 2003 vintage                     |        |       |           |          |        |        |      |         |            |          |
| 2004 vintage                     |        |       |           |          |        |        |      |         |            |          |
| Total Impairments in 2004        | 9      | 26    | 3         | 0        | 1      | 1      | 1    | 0       | 0          | 41       |
| One-Year Impairment Rate in 2004 | 2.3%   | 3.5%  | 1.0%      | 0.0%     | 0.8%   | 0.1%   | 1.1% | 0.0%    | 0.0%       | 1.1%     |
| Total Impairments in 2003        | 33     | 14    | 1         | 2        | 8      | 1      | 0    | 9       | 0          | 68       |
| One-Year Impairment Rate in 2003 | 7.8%   | 3.3%  | 0.4%      | 1.5%     | 5.7%   | 0.2%   | 0.0% | 1.9%    | 0.0%       | 2.5%     |

*Note: HY CBO – high-yield collateralized bond obligations; Resec – resecuritizations, or CDOs of structured finance securities; BalSh Syn – balance sheet synthetic; BalSh CF – balance sheet cash flow; IG CBO – investment-grade CBOs; HY CLO – high yield collateralized loan obligations; Syn Arb – synthetic arbitrage; MV – Market Value*

Almost all newly impaired CDOs in 2004 were originated in the United States; only three were European CDOs, all of which were resecuritizations. By comparison, eleven European CDOs became impaired in 2003, of which eight were synthetic arbitrage tranches and three were HY CBO tranches.

### ***Non-US Non-CDO Structured Finance Impairments Few in Number***

For the first time, Moody's also reviewed the historical impairment experiences in the young international structured finance sector. Out of a total of 2,439 European structured finance securities outside of CDOs, only two tranches became impaired and both occurred in 2004. One is class C2 from an ABS deal, "Fixed-Link Finance B.V." This deal used a two-SPV structure to repackage a portion of Eurotunnel's Junior Debt which is comprised of Tier 1 Junior Debt, Tier 2 Junior Debt and Tier 3 Junior Debt. Class C2 was downgraded to Ca in 2004 and subsequently to C in 2005, because Moody's expects that a debt restructuring will result in a material impairment of a number of Eurotunnel's debt classes.

The second impaired tranche came from an MBS deal, "EuropeLoan Finance N.V." All noteholders of this transaction unanimously agreed to liquidate the underlying assets on April 30, 2004, resulting in the early redemption of all notes. The sale price, however, was insufficient to repay all of the outstanding principal balance on the Class C Notes,

causing a loss of about 10%. Although the parties voluntarily accepted the offer and the loss was not due to the credit deterioration of mortgage loans in the pool, we regard this as a material impairment event.

Out of a total of 2,075 non-CDO tranches rated in regions other than US and Europe, no impairments occurred among transactions issued in Canada, Japan, Australia, and other parts of the Asia Pacific region. Three tranches of Latin America ABS cross-border deals did, however, become impaired in 2002.<sup>11</sup>

In Mexico, the structured export certificates of a deal, “Imexsa Export Trust No.96-1”, were initially rated Ba2 in 1996, downgraded to B2 in 2001, and then to Ca in 2002. The downgrade reflected Imexsa's plan to restructure its debt via a distressed exchange with its certificateholders, offering them a new security that represented a diminished financial obligation.

In Argentina, impairments on BHN IV Mortgage Trust, Series 2000-1, and BACS I Mortgage Trust (Argentina), Series 2001-1 occurred in 2002 when the dollar obligations and dollar liabilities of Argentine financial trusts were reset to be peso-denominated. The re-denomination of contracts greatly decreased the value of assets backing the deals as the collateral was denominated in dollars. Problem was made worse when Argentine trusts' dollar liabilities were re-denominated into pesos. Both tranches carried an initial rating of A1, were downgraded to A3 and then to Baa2 in 2001, and to Ba3 and then to Ca in 2002.

## **Multi-Year Cumulative Material Impairment Rates by Rating**

---

This section presents multi-year cumulative impairment rates for different rating categories and investment horizons, presented on a cohort basis and origination basis. The former indicates the average performance of all securities by rating on any given date, typically at the beginning of a year, regardless of whether the securities were seasoned or newly originated. The latter indicates the performance of newly issued securities by their rating at origination, regardless of whether and how their ratings have changed during a specified time horizon.

### ***Average Multi-Year Cumulative Impairment Rates by Rating***

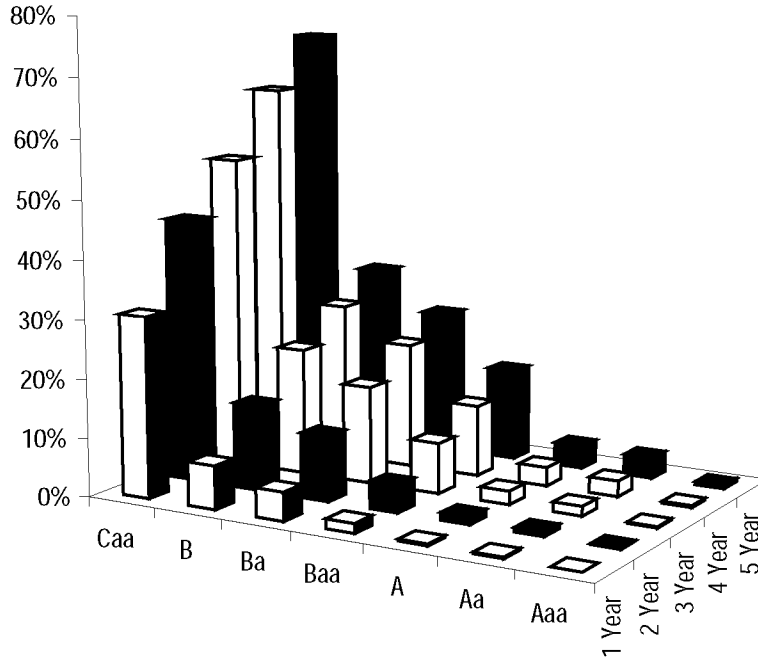
Moody's calculates multi-year cumulative impairment rates by computing marginal impairment rates for each year (adjusting for censored data due to rating withdrawals), using all data observations in the sample including data from recent vintages. Figure 16 compares multi-year impairment rates in structured finance across rating categories (ratings measured at the beginning of each calendar year, also known as cohort ratings) and over various time horizons. Discussions on impairment rates methodology and detailed impairment rates data by cohort rating appear in the appendices.

---

<sup>11</sup>. One CMBS tranche rated in the Asia-Pacific (excluding Japan) region was downgraded to Ca in 2003. The tranche is expected to mature and be paid in full in September 2005, hence considered to be unimpaired.

Figure 16

**Multi-Year Cumulative Material Impairment Rates by Cohort Rating, 1993-2004**



The results in Figure 16 demonstrate that on average Moody's ratings effectively rank-ordered structured finance credit risk across all time horizons. Figure 16 also shows that impairment rates are not "linearly" increasing with respect to the length of the rating horizon and the rate of increase over time differs across rating categories. That is, marginal impairment rates, which were used to construct cumulative impairment rates, vary by time horizon and rating. This is seen more clearly in Figure 17.

Figure 17

**Average One-year Marginal Impairment Rates by Year after Cohort Formation, 1993-2004**

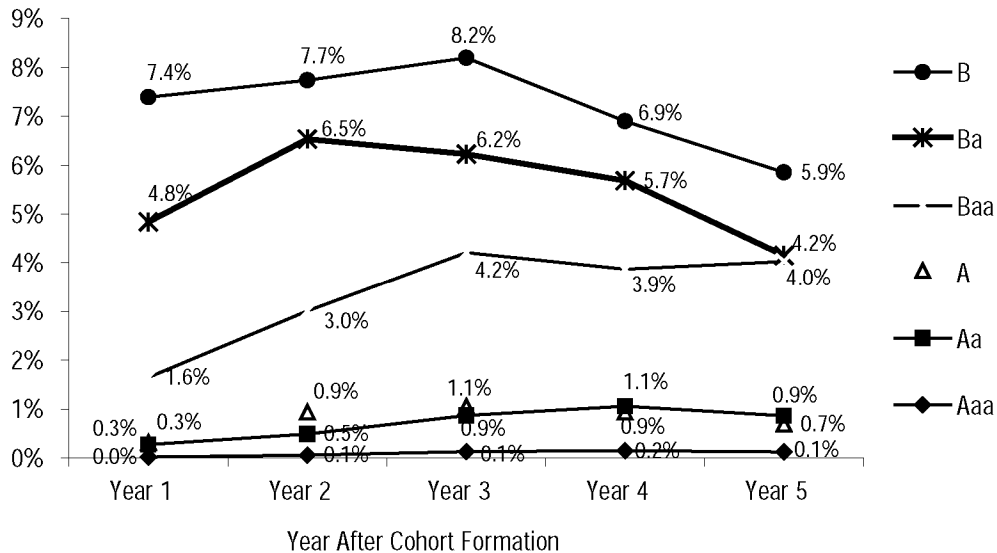


Figure 17 demonstrates that:

- The marginal impairment rates of Ba- and B-rated securities were much higher in the second and third year than in the first, fourth and fifth years, displaying a “hump” shape.
- For Aaa- and Aa-rated securities, the marginal impairment rates appear to peak in year 4 rather than year 2 or year 3.
- For single-A and Baa-rated securities, the peak occurs in year 3 as well, but the decline in marginal impairment rates in years 4 and 5 were not material, compared with those of Ba and single-B rating categories.

In addition, Caa-rated securities’ marginal impairment rates (not shown in the figure) peak in the first year at 30.8% after cohort formation. All these findings suggest that the peak of marginal impairment rates by cohort rating increase with ratings – the higher the ratings, the later the peaks are observed.

### ***Comparing Cumulative Impairment Rates by Cohort and Original Rating***

As in previous reports, we also calculate cumulative impairment rates by original rating in addition to by cohort rating. Figure 18 shows five-year material impairment rates by original rating, compared with the five-year impairment rates by cohort rating.

The five-year impairment rates by original rating have been lower than those by cohort rating, except for five-year impairment rates in the Aaa rating category, which were slightly higher by original rating than by cohort rating. Furthermore, the ratios of cohort-based rates over origination-based rates increased, as ratings became lower. We would stress, however, that the difference between these two types of impairment rates depends strongly on how ratings have migrated before the tranches became impaired and when the impairments occurred relative to their dates of origination or cohort dates. As a result, the differences vary by asset classes, rating categories, sample periods, and time horizons. (See Appendix for discussions on impairment rates methodology and detailed impairment rate data by original rating.)

Figure 18  
**Five-Year Cumulative Material Impairment Rates by Original and Cohort Rating, 1993-2004**

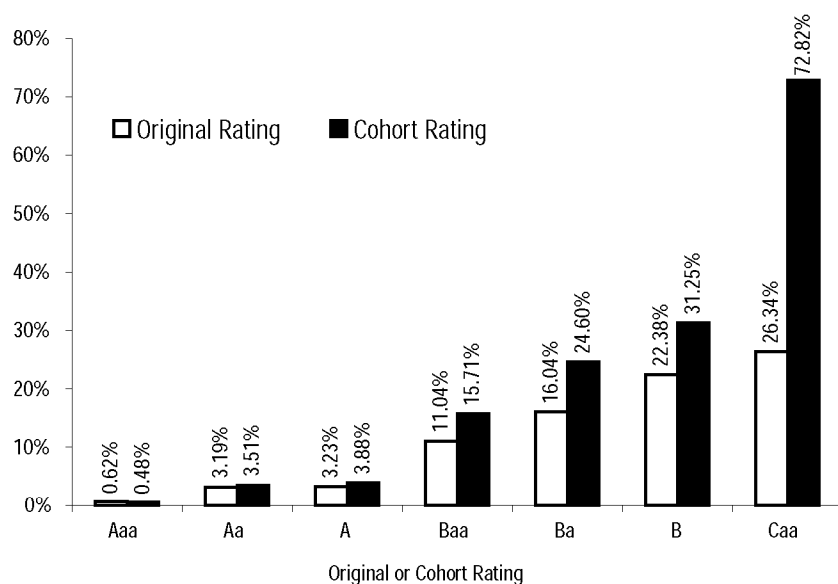


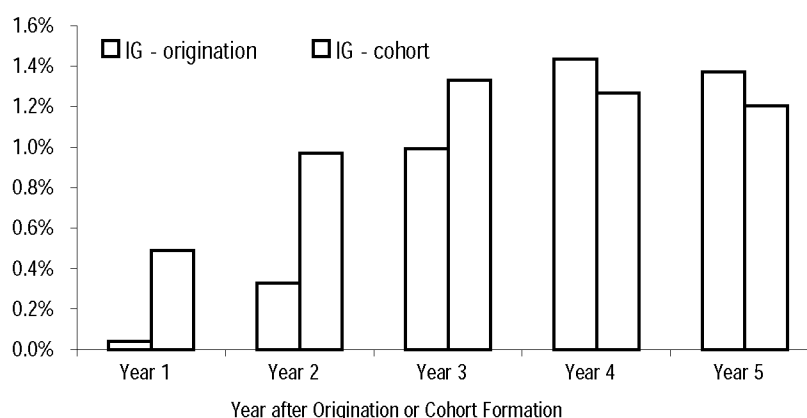
Figure 19 compares average marginal impairment rates calculated using the origination and cohort methods separately for investment-grade and speculative-grade categories. It shows that:

- Marginal impairment rates based on original ratings have also increased first before they peaked and then declined. The peak occurs in the fourth year for both the investment-grade and speculative-grade categories.
- By comparison, the cohort-based marginal impairment rates in the speculative-grade category are higher and relatively flatter in the first three years, and then decline. For the investment-grade category, the cohort-based and origination-based rates show similar patterns except they have different peaks.
- Marginal impairment rates based on cohort ratings are generally higher than those based on original ratings.

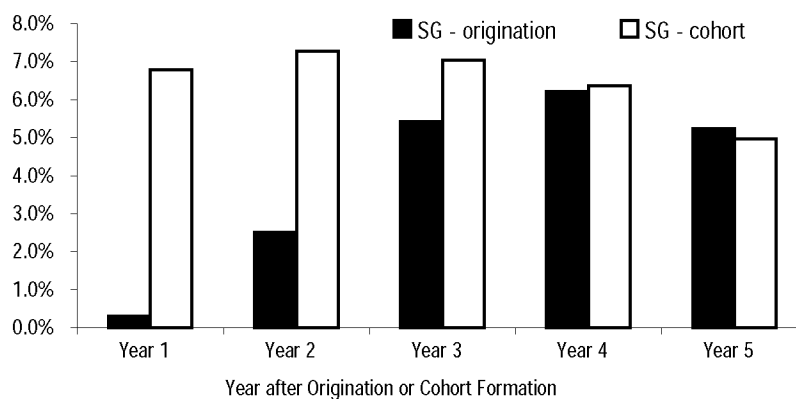
Figure 19

### Average One-Year Marginal Impairment Rates by Original and Cohort Rating, 1993-2004

#### Panel I: Investment-Grade (IG):



#### Panel II: Speculative-Grade (SG):

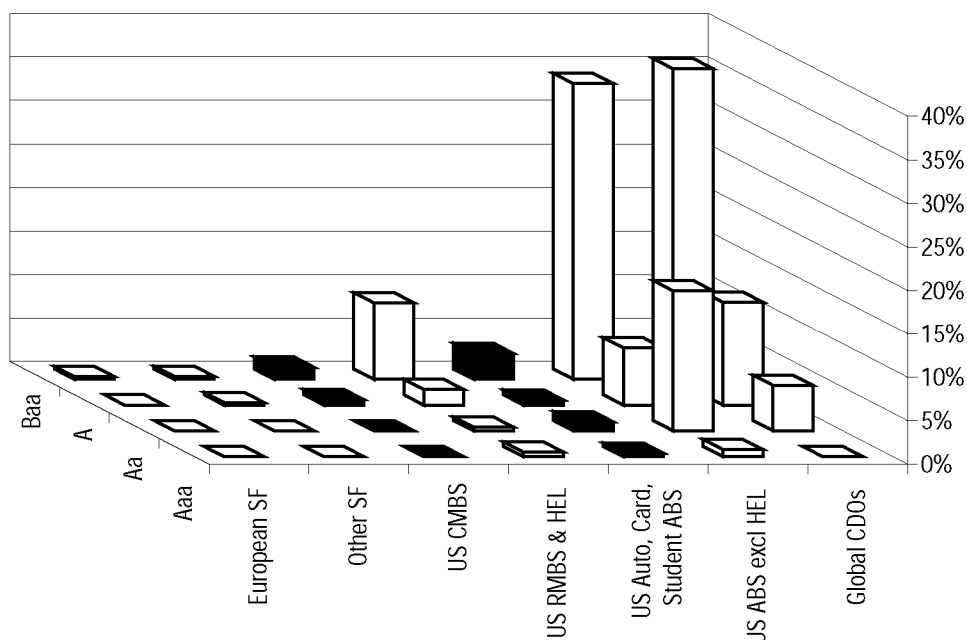


### Comparing Cumulative Impairment Rates across Sectors

The structured finance sector includes asset classes that have so far demonstrated distinct performance. As we have shown, some asset classes in the US ABS sector and global CDOs experienced unprecedented distress during the 2001-2003 period, while others such as US auto ABS, credit-card ABS, RMBS and CMBS sectors exhibited outstanding performance. Additionally, non-US non-CDO structured finance has experienced few impairments. Figure 20 takes a closer look at the diverse performance experience across sectors by plotting five-year cumulative impairment rates by cohort rating in the investment-grade category. Investment-grade rated securities represent 99% of the entire structured finance market on a volume basis, of which more than 80% was rated Aaa at issuance.

Figure 20

### Five-Year Cumulative Material Impairment Rates By Cohort Rating and Sector, 1993-2004



Note: See notes for Figure 2 concerning sector definitions. HEL securities have been grouped with RMBS into one category – US RMBS&HEL and have been removed from the US ABS sector. The category “US Auto, Card, Student ABS” includes US ABS securities backed by automobile loans, credit card receivables, and student loans.

The excellent performance of US CMBS, RMBS and HEL, and non-CDO structured finance sectors outside the United States is self-evident in Figure 20, as most of their investment-grade rating categories recorded low impairment rates. However, it is also clear that US ABS and global CDOs have experienced weaker performance, with substantially higher impairment rates across all rating categories except for Aaa.

The unexpectedly high impairment rates in the Aa, single-A, and Baa categories of these sectors were driven by a number of factors, including primarily by:

- poor collateral performance of ABS backed by manufactured housing and franchise loans. In 2004 alone, 30 MH and 4 franchise loan ABS securities that were initially rated Aa became impaired, bringing the total of Aa-rated impairments to 44 for MH and 8 for franchise-loan ABS. Altogether, these two ABS categories accounted for 71% of all 73 impaired Aa securities in the US ABS sector.
- corporate failures affecting a number of US ABS transactions — Heilig-Meyers (retail credit card deals), NPF (healthcare receivable deals), and DVI (equipment lease deals). In particular, the failure of National Century Financial Enterprises (NCFE), which filed for voluntary bankruptcy on November 18, 2002, caused the material impairments on seven Aaa-rated and 13 Aa-rated securities. The failure of DVI Financial Services, Inc. (DVI), which filed for Chapter 11 bankruptcy protection on August 25, 2003, caused two Aaa-rated, six Aa-rated, seven single-A rated, and eight Baa-rated securities to become impaired.
- the almost unprecedented corporate distress during the 2000-2002 economic recession, which impacted a large number of high-yield collateralized bond obligations. By the end of 2004, a total of 191 HY CBO tranches were impaired, accounting for 62% of all impaired CDO securities. The distress in the US ABS sector during 2002-2003 also had a strong negative impact on the global CDO sector. By year-end 2004, the total number of impaired resecuritization CDO tranches has risen to 46, or about 15% of all CDO impairments.

Meanwhile, Figure 20 also reveals that a traditional segment of the US ABS sector that includes securities backed by auto loans, credit card receivables, and student loans have performed well and similar to those of US CMBS and RMBS. This traditional segment makes up roughly half of the US non-HEL ABS universe.

## Loss Severity Rates Given Default and Cumulative Loss Rates

This section presents analysis of loss severity rates, which are also known as loss given default (LGD) rates, and combines information on loss severity rates with data on material impairment rates to derive cumulative loss rates. Estimating expected final LGD on defaulted structured finance securities is particularly challenging because most securitizations are structured as pass-through securities, and, unlike for defaulted corporate securities, market prices are rarely available for defaulted structured securities. In previous research, we have developed models to estimate final LGD for default tranches backed by residential mortgage collateral and for defaulted collateralized bond obligations. In this report, we update those models and apply their results to other asset classes to derive estimated aggregate loss rates.

Moody's regularly updates the payment and loss records of defaulted structured finance securities. For each tranche, we are able to calculate the present value of losses (to date). For many tranches, the loss rate to date is effectively the final loss severity because their balances have been written down to zero at or before their final maturity. Many other defaulted tranches, however, have positive balances and potential sources of future cash distributions to investors; hence, their expected final loss severity rates need to be estimated.

### *Descriptive Statistics for the Percentages of Interest Shortfalls and Principal Losses to Date for Impaired ABS, CMBS and RMBS Securities*

We define "matured" defaults as securities whose balances were either partially or completely written down to zero by the end of 2004. All other impaired securities are called "non-matured" defaults. Our sample consists of 212 matured defaults, and 365 non-matured defaults. Figure 21 provides descriptive statistics regarding the percentages of interest shortfalls and principal losses on these impaired securities. In a later section, we will analyze more rigorously the loss severity rates of impaired RMBS and HEL securities using an approach developed in the April 2004 *Moody's Special Comment*, "Measuring Loss Severity Rates of Defaulted Residential Mortgage-Backed Securities: A Methodology."

*Figure 21*

**Descriptive Statistics for the Percentages of Interest Shortfalls and Principal Losses of Impaired US ABS, CMBS and RMBS Securities, 1993-2004**

|  | US ABS |       |                   | US CMBS | US RMBS | US ABS, CMBS, RMBS Combined |
|--|--------|-------|-------------------|---------|---------|-----------------------------|
|  | MH     | HEL   | ABS excl. MH, HEL |         |         |                             |
| <b>Matured Defaults:</b>                       |        |       |                   |         |         |                             |
| Number of Tranches                             | 72     | 35    | 16                | 9       | 80      | 212                         |
| Average Cumulative Interest Shortfalls         | 5.6%   | 0.0%  | 8.9%              | 1.5%    | 0.9%    | 3.4%                        |
| Average Cumulative Principal Losses            | 94.2%  | 61.1% | 85.6%             | 46.3%   | 49.5%   | 69.5%                       |
| <b>Non-matured Defaults:</b>                   |        |       |                   |         |         |                             |
| Number of Tranches                             | 126    | 60    | 52                | 68      | 59      | 365                         |
| Average Cumulative Interest Shortfalls to date | 14.5%  | 2.2%  | 10.4%             | 3.3%    | 1.1%    | 8.0%                        |
| Average Cumulative Principal Losses to date    | 25.0%  | 20.6% | 18.2%             | 11.4%   | 28.2%   | 21.3%                       |
| Average Remaining Principal Balances           | 65.8%  | 54.4% | 85.1%             | 87.8%   | 35.0%   | 65.5%                       |

Note: Shortfalls and losses are expressed as a percentage of the tranches' original balance. A discount rate of 7.5% was used for the purpose of creating this table and all shortfalls and losses are assumed to have occurred at the end of sample period. The 7.5% discount rate is roughly the average coupon rate of all impaired RMBS and HEL tranches (with an average rating of Baa3) analyzed in a later section.

The descriptive statistics have at least three notable implications:

- First, non-HEL ABS tranches suffered high principal losses after they became impaired. A total of 72 impaired and matured MH ABS securities have lost almost all their principal. By comparison, final losses among impaired CMBS, RMBS and HEL securities were more moderate, ranging from about 42% for CMBS to about 61% for HEL.
- Second, for matured defaults, interest shortfalls contributed a relative small portion of the overall losses, averaging 3.4% of the tranches' original balance compared with an average principal loss of 69.2%. By contrast, for non-matured defaults, interest shortfalls to date have been significant, averaging 7.6% compared with an average principal loss to date of 20.3%.



We do, however, expect many non-matured defaults to sustain additional principal losses as they mature. Eventually, final principal losses will likely outweigh the interest shortfalls by a larger margin. Note that matured defaults are likely to experience higher final losses than will non-matured defaults due to survivorship bias, a finding we reported previously.<sup>12</sup>

- Third, in general, the relative size of interest shortfalls compared to principal losses has been much higher in MH ABS, non-HEL ABS and CMBS securities than it was in residential mortgage-backed securities such as HEL and RMBS.<sup>13</sup>

### ***Estimated Final Loss Severity Rates in RMBS and HEL***

After incorporating the default and loss experiences observed in 2004 into our data sample, the total number of matured and uncured defaults in the RMBS and HEL sector increased to 131 and the number of non-matured uncured defaults increased to 140.<sup>14</sup> Using the expanded data sample, we validated our previous LGD projection model. (Appendix 2 provides additional discussions on the latest LGD projection model.)

Figure 22 summarizes our latest LGD rate estimates, which are similar to those reported in our previous studies.

Figure 22  
**Estimated Final Loss Severity Rates by Rating for Impaired RMBS/HEL Securities, 1987-2004**

| Rating at Default | % of Default-Date Balance |       |                    | Rating at Origination | % of Original Balance |       |                    |
|-------------------|---------------------------|-------|--------------------|-----------------------|-----------------------|-------|--------------------|
|                   | Number of Securities      | Mean  | Standard Deviation |                       | Number of Securities  | Mean  | Standard Deviation |
| Aaa               | 0                         |       |                    | Aaa                   | 11                    | 2.3%  | 1.2%               |
| Aa                | 4                         | 2.9%  | 2.8%               | Aa                    | 29                    | 7.2%  | 6.7%               |
| A                 | 7                         | 34.4% | 32.3%              | A                     | 16                    | 28.2% | 19.8%              |
| Baa               | 35                        | 36.3% | 30.0%              | Baa                   | 93                    | 35.4% | 23.9%              |
| Ba                | 54                        | 41.1% | 30.2%              | Ba                    | 47                    | 28.5% | 21.4%              |
| B                 | 67                        | 55.6% | 33.6%              | B                     | 45                    | 53.1% | 26.3%              |
| Caa               | 43                        | 51.2% | 32.7%              |                       |                       |       |                    |
| Ca/C              | 31                        | 60.2% | 26.8%              |                       |                       |       |                    |
| Investment-Grade  | 46                        | 33.1% | 30.1%              | Investment-Grade      | 149                   | 26.7% | 23.9%              |
| Speculative-Grade | 195                       | 51.4% | 32.0%              | Speculative-Grade     | 92                    | 40.5% | 26.8%              |
| All               | 241                       | 47.9% | 32.4%              | All                   | 241                   | 32.0% | 25.9%              |

Note: Defaults are identified as of December 31, 2004; however, loss severity rate statistics are updated through January 2005. This table combines both matured and non-matured tranches.

### ***Estimated Final Loss Severity Rates in CDOs***

In our first study of CDO defaults and losses, we derived a simple model to project final LGD rates for defaulted high yield CBO tranches, which have historically experienced the greatest number of defaults within the broader CDO sector.<sup>15</sup> CDO impairments in 2004, however, have been relatively more concentrated in resecuritization CDOs (CDOs of structured finance securities) than in high yield CBOs. Nevertheless, after reviewing the key characteristics of these impaired tranches, we concluded that the same model we derived for CBOs is generally appropriate for measuring expected final LGDs on resecuritization CDOs and CLOs.

One change, however, in the model was necessary. The weighted average spreads in resecuritization CDOs have been generally lower than those in HY CBOs because most assets in HY CBO deals were speculative-grade at deal origination but most assets in resecuritization CDO deals were initially Baa-rated. As a result, we used a cost-of-funds assumption for impaired resecuritization deals that is different from that for impaired HY CBOs.

Additionally, for synthetic deals, tranches in the sample were mostly impaired at the time of liquidation; their final loss rates did not need to be estimated. Our latest LGD rate estimates are summarized in Figure 23.

12. "Measuring Loss Severity Rates of Defaulted Residential Mortgage-Backed Securities: A Methodology," Moody's Special Comment, April 2004.

13. It is important to note that prepayment-related interest shortfalls, which have been observed on RMBS and HEL securities, are not considered to be payment defaults in our structured finance default and loss studies. In general, any non-credit related interest shortfalls are not counted as payment defaults.

14. Only defaulted and uncured securities – impaired tranches – are included in the study of loss severity rates. Including loss severity rates for all defaulted securities, including cured ones, would of course lead to lower estimates, particularly in the investment-grade category where most cured defaults are observed.

15. "Default & Loss Rates of U.S. CDOs: 1993-2003," Moody's Special Comment, March 2005.

Figure 23  
**Estimated Final Loss Severity Rates for Impaired CDO Tranches, 1993-2004**

| Original Rating   | Counts | Mean  | Standard Deviation | Deal Type       | Counts | Mean  | Standard Deviation |
|-------------------|--------|-------|--------------------|-----------------|--------|-------|--------------------|
| Aaa               | 0      |       |                    | EM              | 2      | 20.2% | 19.2%              |
| Aa                | 3      | 15.7% | 20.2%              | Syn Arb         | 15     | 44.5% | 39.4%              |
| A                 | 12     | 67.4% | 38.6%              | BalSh Syn       | 12     | 51.0% | 45.6%              |
| Baa               | 115    | 75.7% | 32.9%              | HY CLO          | 14     | 56.6% | 39.1%              |
| Ba                | 54     | 89.0% | 25.1%              | IG CBO          | 5      | 80.5% | 23.2%              |
| B                 | 32     | 90.9% | 25.0%              | Resecurizations | 33     | 87.7% | 23.6%              |
| Caa or below      | 0      |       |                    | HY CBO          | 135    | 87.9% | 24.3%              |
| Investment-Grade  | 130    | 73.6% | 34.3%              |                 |        |       |                    |
| Speculative-Grade | 86     | 89.7% | 24.9%              |                 |        |       |                    |
| All               | 216    | 80.0% | 31.8%              | All             | 216    | 80.0% | 31.8%              |

Note: Loss severity rates are present valued and expressed as a percentage of original balances. Most impaired CDO tranches were deferring interest or PIKing, hence, their outstanding principal balances were either higher than or equal to the original balances. Further, although LGD rates as a share of default-date balances are not shown in the table, they are similar to those as a share of original balances because there has been little amortization of principal on these tranches. In addition, HY CBO stands for high-yield collateralized bond obligations; Resecurizations are CDOs of structured finance securities; BalSh Syn stands for balance sheet synthetic; IG CBO is investment-grade CBOs; HY CLO represents high yield collateralized loan obligations; Syn Arb stands for synthetic arbitrage; EM represents emerging market CDOs.

Figure 23 reveals four interesting findings.

1. LGD rates have varied systematically with original rating levels — single-B and Ba securities have experienced higher LGDs than Baa's, which are in turn higher than single-A's and Aa's LGDs. Estimated LGDs are quite low for the three Aa tranches that defaulted (the median LGD of these Aa tranches is only 6.2%) and would presumably be extremely low on a Aaa tranche if one were to default.
2. More than half of all impaired CDO (mainly HY CBOs) tranches initially carried a Baa rating — only four of them were rated Baa1 — with an estimated average loss severity rate of 76%.
3. Most impaired resecuritization CDOs and HY CBOs are expected to sustain high loss rates of about 87%. This is consistent with the current rating status of these impaired tranches. Of all 203 impaired HY CBOs and resecuritization CDO securities, 160, or roughly 78%, have been downgraded to Ca or C. For tranches originally-rated Aa or single-A, LGD rates were projected to be lower than those rated Baa or below.
4. Average LGD rates have been substantially lower for synthetic tranches (including synthetic arbitrage, balance sheet synthetic tranches) and CLO tranches than for HY CBOs and resecuritization CDOs (most are cash flow resecuritization deals).<sup>16</sup>

### **Multi-Year Cumulative Loss Rates by Rating**

Multi-year cumulative loss rates are the product of multi-year cumulative impairment rates and multi-year cumulative LGD rates. The method of estimating cumulative LGD rates was detailed in previous Moody's studies and an example is also shown in Appendix 2.<sup>17</sup>

In our previous reports, we have applied our estimates of RMBS and HEL LGD rates by rating and time horizon to non-matured ABS, CMBS and RMBS securities because we lacked sufficient loss data to obtain estimates of final LGD rates on non-HEL ABS and CMBS tranches. We now, however, have considerable data on CDOs defaults which can be used, in conjunction with the LGD information on defaulted mortgage-backed tranches to derive estimated LGDs for other types of securitization tranches. As a result, we implemented the following.

First, we continue to use LGD estimates from the RMBS and HEL sector as proxies of LGD for defaulted CMBS tranches with the same rating.

Second, we note that impaired RMBS, HEL, and CMBS tranches in the current data sample totaled 320, while impaired CDOs totaled 309. The sizes of these two distinct sub-samples are roughly equal. Therefore, for all structured finance as a whole, we applied an equally weighted average of estimated LGD rates in the RMBS/HEL sector and those in the CDO sector, controlling for rating and time horizon. In addition, we used the same equally-weighted LGD averages for non-HEL ABS securities.

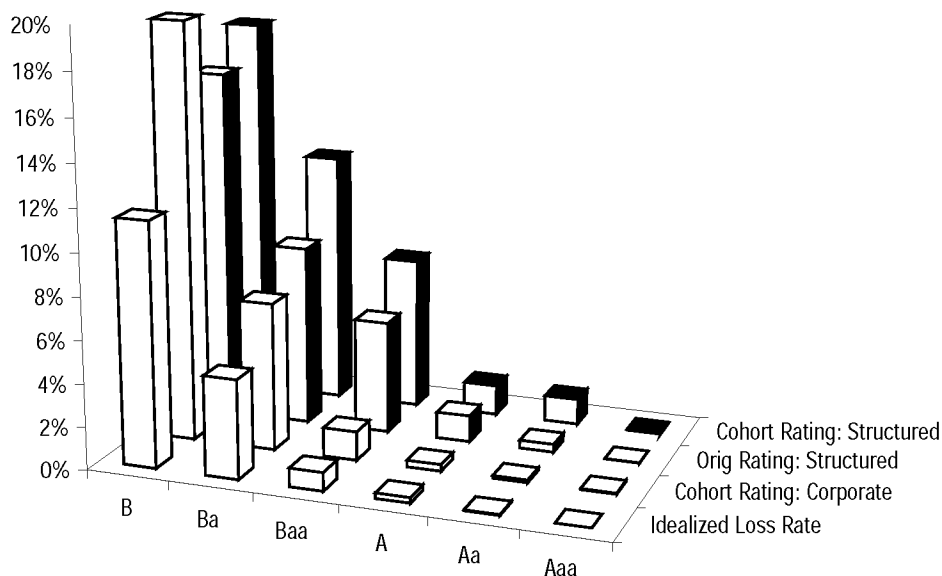
16. Most synthetic tranches became impaired at liquidation and their final loss rates are therefore realized, rather than model-projected.

17. "Default & Loss Rates of Structured Finance Securities: 1993-2003," Moody's Special Comment September 2004.

Figure 24 plots the resulting estimated five-year cumulative loss rates by rating, after multiplying these estimated multi-year LGD rates times the multi-year cumulative impairment rates. The loss rates are presented both on a cohort-ratings and original-ratings basis. Moreover, these estimates are contrasted with five-year loss rates estimated for the corporate sector and with the structured finance sectors' idealized loss rate table. (Other investment horizons are presented in Figures 32 and 33 in Appendix 3.)

Figure 24

### Estimated Five-Year Cumulative Loss Rates by Rating, 1993 – 2004



*Note: All structured finance securities are included. We assume that LGD rates of all structured finance securities are the equally-weighted averages of estimated LGD rates in RMBS and HEL and estimated LGD rates in CDOs. Loss rates by cohort ratings in the corporate sector are obtained from Moody's 2004 corporate bond default study.\* Idealized loss rates of each broad rating category are taken from Moody's idealized loss rate table and are represented by ratings with a numeric modifier 2 for each broad rating category.*

\* "Default and Recovery Rates of Corporate Bond Issuers, 1920-2004," Moody's Special Comment, January 2005.

Figure 24 demonstrates the following:

- Estimated five-year horizon loss rates decrease significantly as ratings increase.
- Average loss rates by original rating were lower than those by cohort ratings except for Aaa-rated tranches, suggesting that, after controlling for ratings and time horizons, moderately seasoned securities on average have performed worse than newly issued securities with the exception of Aaa.
- Aaa-rated structured securities performed well, as expected.
- Loss rates for non-Aaa rating categories have generally been higher in structured finance than those reported in our idealized loss rates and those experienced in the corporate sector.

We note that these statistics are not weighted by volume. Because the highest rated tranches tend to be much larger in size than other tranches, the overall loss rates weighted by volume tend to be much lower in structured finance than in the corporate sector. Using this same data presented in Figure 24, but weighting by the total original balances in each rating category, we find that overall five-year loss rates are only 40 basis points, as reported in Figure 1.

## Related Research

### Special Comments:

[Default & Loss Rates of U.S. CDOs: 1993-2003, March 2005, #91692](#)

[Default & Loss Rates of Structured Finance Securities: 2004 First Half Update, January 2005 #90843](#)

[Default & Loss Rates of Structured Finance Securities: 1993-2003, September 2004 #88692](#)

[Measuring Loss Severity Rates of Defaulted Residential Mortgage Backed Securities, April 2004 #86769](#)

[Payment Defaults and Material Impairments of U.S. Structured Finance Securities: 1993-2002, December 2003 #80247](#)

[Structured Finance Rating Transitions: 1983-2004, February 2005, #91392](#)

[Structured Finance Rating Transitions: 1983-2003, February 2004 #81239](#)

[Structured Finance Rating Transitions: 1983-2002, Comparisons with Corporate Ratings and Across Sectors, January 2003 #77291](#)

[Structured Finance Watchlist Resolutions: 1992-2003, June 2004 #87305](#)

[Guide to Moody's Default Research: June 2005 Update, #93075](#)

[Default and Recovery Rates of Corporate Bond Issuers, 1920-2004, January 2005 #91233](#)

[Moody's Rating Actions, Reviews, and Outlooks: Quarterly Update, January 2005 #91285](#)

[The Performance of Moody's Corporate Bond Ratings: March 2005 Quarterly Update, April 2005 #91196](#)

### Structured Finance Special Reports:

[2004 Review and 2005 Outlook: US ABS, January 2005 #SF49728](#)

[2004 Review and 2005 Outlook: Commercial ABS, January 2005 #SF49699](#)

[2004 Review and 2005 Outlook: Manufactured Housing Asset Backed Securities, January 2005 #SF49729](#)

[2004 Review and 2005 Outlook: US CMBS, Record Issuance Expected but Lending 'Frothiness' Persists, January 2005 #SF50182](#)

[U.S. CMBS: Emerging Trends in Commercial Real Estate CDOs, May 2005, #56265](#)

[Rating Changes in the US Asset-Backed Securities Market: 2005 First Quarter Update, April 2005 #SF54862](#)

[Credit Migration of CDO Notes, 1996-2004, for US and European Transactions, March 2005, #SF52111](#)

*To access any of these reports, click on the entry above. Note that these references are current as of the date of publication of this report and that more recent reports may be available. All research may not be available to all clients.*

## Appendix 1

### Impairment Rates Methodology

#### *How to Calculate Multi-Year Cumulative Impairment Rates by Cohort Rating*

Moody's uses the same method to calculate multi-year cumulative impairment rates as that used in Moody's corporate issuer default studies. In particular, the cumulative default rate calculation used in Moody's corporate bond default research makes an adjustment to the denominator to reflect issuers whose ratings were withdrawn, and therefore not at risk of default over the measurement period. There are therefore three possible states that need to be modeled in the default rate: survival to the next time period, rating withdrawal, and default.

The cumulative default rate for a time horizon  $T$  is calculated as:

$$C(D,T) = 1 - \prod_{t=1}^T (1 - d_t)$$

Where  $d_t$  is the marginal default rate:

$$d_t = \frac{x_t}{n_t - w_t - z_t}$$

Where  $x_t$  is the number of defaulters in year  $t$ ,  $w_t$  is the number of rating withdrawals in year  $t$ , and  $n_t = n_{t-1} - x_{t-1} - w_{t-1}$ , the number of issuers in the cohort at time  $t$ . When the time horizon  $T$  is equal to 1, the cumulative default rate and the marginal default rate are equal, and the resulting rate represents the annual default rate.

Let us now look at an example, assuming all securities are carrying the same rating in both years.

*Figure 25*

| <b>An Example for Calculating a Two-Year Cumulative Impairment Rate</b> |          |                      |                                  |                            |           |                      |  |
|---|----------|----------------------|----------------------------------|----------------------------|-----------|----------------------|--|
| Year 1  |          |                      | Year 2                           |                            |           |                      |  |
| At the beginning of year 1  |          | At the end of year 1 |                                  | At the beginning of year 2 |           | At the end of year 2 |  |
| Number of Securities Issued   | Impaired | Withdrawn            | Number of Securities Outstanding | Impaired                   | Withdrawn |                      |  |
| 200   | 10       | 95                   | 95                               | 5                          | 90        |                      |  |

In the example, the marginal impairment rate in the first year is  $(10+5)/(200+95-95/2-90/2)$ , or 7.41%. The marginal impairment rate in the second year is  $5/(95-90/2)=10\%$ . The marginal survival rates are 92.6% and 90.0% in the first and second year, respectively. The two-year cumulative survival rate is  $92.6\% * 90.0\% = 83.3\%$ . Therefore, the two-year cumulative impairment rate is 16.7%.

We believe our method of calculating cumulative impairment rates provides the most relevant information to investors who want to look at the historical impairment experience when evaluating the risk of an investment with any particular expected maturity. There are, however, at least two other approaches found in the literature, which tend to produce lower impairment rates and/or fail to use all available information. One approach, which is similar to the above method, calculates marginal impairment rates first, but it does not adjust for withdrawals, hence,  $n_t = n_{t-1} - x_{t-1}$ . As a result, the second year marginal impairment rate is  $5/(95+95-90/2)=3.45\%$ . The two-year cumulative impairment rate becomes  $(1-7.41\%)*(1-3.45\%) = 10.6\%$ .

Another approach calculates cumulative impairment rates using a ratings transition matrix, treating impairment as a "rating" category (we note that Moody's does not have a "D" or default rating category). For a given time horizon, ratings transition frequencies are calculated using only ratings observations at the beginning and the end of the time horizon. Newly issued ratings that have not spanned the entire time horizon are not included. For examples, if additional securities are issued at the beginning of year 2, the impairment experience of those securities would not be included in a two-year rating transition rate calculation.

### How to Calculate Multi-Year Cumulative Impairment Rates by Original Rating

As in previous structured finance default studies, we calculate impairment rates for both cohort and original ratings using essentially the same method. We find that cumulative impairment rates by original rating have on average been lower than those by cohort rating. This can be best illustrated in the following example (Figure 26).

Figure 26

**An Example Showing the Difference between Cohort-Based Impairment Rates and Origination-Based Impairment Rates**

| Year 1                                       |                      |           | Year 2  |                      |           |
|--|----------------------|-----------|---|----------------------|-----------|
| At the beginning of year 1                   | At the end of year 1 |           | At the beginning of year 2                        | At the end of year 2 |           |
| Number of Securities Issued and Their Rating | Impaired             | Withdrawn | Distribution of Outstanding Securities by Rating  | Impaired             | Withdrawn |
| 100, rated Baa                               | 0                    | 0         | 95, remain Baa rated<br>5, downgraded to single-B | 0                    | 95        |
| 100, rated single-B                          | 0                    | 0         | 100, remain single-B                              | 5                    | 95        |

In the example, there are 100 Baa-rated securities and 100 single-B rated securities at the beginning of year 1. 95 of the 100 Baa-rated securities keep their Baa rating in year 2 and are withdrawn at the end of year 2, but five of them are downgraded to single-B in year 1 before they become impaired in year 2. Five of the 100 single-B rated securities become impaired in year 2 and the rest are all withdrawn in year 2.

Based on cohort ratings, the first year marginal impairment rate for the Baa category is 0%. The second year marginal impairment rate for Baa is  $5/(100-95/2)=9.5\%$ . Hence, the two-year cumulative impairment rate for the Baa rating category is 9.5%. In addition, the two-year cumulative impairment rate for the Baa rating category by original rating is also 9.5%.

For the single-B rating category, the first year marginal impairment rate by cohort rating is  $(0+5+5)/(100+100+5-95/2)=6.35\%$ . Note that both the numerator and denominator include five single-B securities in year 2 that are initially rated Baa in year 1. The second year marginal impairment rate by cohort rating is  $5/(100-95/2)=9.5\%$ . Therefore, the two-year cumulative impairment rate is  $(1-6.35\%)*(1-9.5\%)=15.25\%$ .

However, by original rating, the first year marginal impairment rate is 0% for the single-B category, while the second year marginal impairment rate is 9.5%, the same as that by cohort rating. This implies that the two-year cumulative impairment rate by original rating for single-B is 9.5%, which is substantially lower than the cumulative impairment rate of 15.25% by cohort rating. This is the result of five single-B rated securities that become impaired in year 2 but were not rated single-B initially; therefore they were not included in the calculation of original-B -rating-based cumulative impairment rates.

Finally, there is one change in this report to the calculation of impairment rates by original rating. In our previous reports, our unit of measurement was the number of calendar years, ignoring the month of origination and impairment. In this report and going forward, the time horizons of cumulative impairment rates by original rating are measured by the actual number of months, measured from the year and month of origination to the year and month of impairment.

For example, using the old method (the calendar year approach), a tranche originated in 1998 and impaired in 2000 is considered to have become impaired three years after origination, but using the new approach, the actual month of origination and actual month of impairment are first identified and then used to determine the number of years after origination, which typically is smaller than that using the old approach.

Because we report cumulative impairment rates on a yearly basis, impairment rates using the new method may differ materially from those using the old method. In some cases, cumulative impairment rates of two time horizons that are only a few months apart may be markedly different, particularly when impairments are clustered, rather than evenly distributed over time. As a result, our updated five-year cumulative impairment rates by original rating and sector are generally higher than those reported previously, especially among investment-grade rating categories where impairments tend to be back-loaded.

Figure 27 highlights the differences of five-year impairment rates of all structured finance securities using different methods, depending on whether annual marginal impairment rates are calculated and whether withdrawn ratings are properly adjusted.

Figure 27

**Five-Year Cumulative Impairment Rates Calculated Using Different Methods, 1993-2004**

|     | Original Rating, Marginal Approach, Unadjusted for WR | Original Rating, Marginal Approach, Adjusted for WR | Cohort Rating, Marginal Approach, Unadjusted for WR | Cohort Rating, Marginal Approach, Adjusted for WR | Cohort Rating, Transition Matrix Approach, Unadjusted for WR |
|-----|---|---|---|---|--|
| Aaa | 0.5%  | 0.6%  | 0.4%  | 0.5%  | 0.3%   |
| Aa  | 2.9%  | 3.2%  | 3.0%  | 3.5%  | 1.5%   |
| A   | 3.0%  | 3.2%  | 3.2%  | 3.9%  | 1.9%   |
| Baa | 10.0%   | 11.0%   | 13.9%   | 15.7%   | 12.6%  |
| Ba  | 15.2%   | 16.0%   | 22.5%   | 24.6%   | 19.4%  |
| B   | 21.2%   | 22.4%   | 29.0%   | 31.2%   | 25.9%  |
| Caa | 20.2%   | 26.3%   | 66.1%   | 72.8%   | 58.2%  |

Three observations are noteworthy:

- Using the marginal approach, cumulative impairment rates adjusted for withdrawals are higher than those unadjusted for withdrawals, but only by a small margin based on both original rating and cohort rating.
- Cumulative impairment rates of securities rated Baa or below are lower by original rating than by cohort rating, regardless of whether withdrawals are adjusted. For securities rated single-A or above, original-rating-based cumulative impairment rates are similar to those based on cohort ratings, independent of withdrawal adjustments.
- Cumulative impairment rates by cohort rating using the transition matrix approach are lower than those using the marginal approach for all cohort rating categories because some of the poor performing securities were issued after January 1, 2000, when the last five-year cohort was formed and employed in the calculation of five-year cumulative impairment rates under the transition matrix approach.

## Appendix 2

### LGD Rates Methodology

---

#### *Revisiting LGD Projection Model for RMBS/HEL*

After carefully reviewing the data and model results, we have made two changes to the projection model for RMBS and HEL.

First, we decided to exclude non-standard RMBS and HEL securities from the sample to improve the validity and performance of the model for standard RMBS and HEL tranches. This change led to the exclusion of 29 HEL tranches backed by home improvement loans and resecuritized RMBS securities, leaving a total of 242 impaired tranches in the study.

Second, we found that LGD rates varied by tranches' origination year, particularly before and after 1998.<sup>18</sup> As a result, we added an origination-year dummy variable in the static LGD regression model. The dummy variable equals “1” if a tranche was originated in or after 1998, “0” otherwise.

With this data sample, we re-estimated the static model, in which LGD is expressed as a share of default-date-balance in the model, as follows:<sup>19</sup>

$$\begin{aligned} \text{Log(LGD/(1-LGD))} = & -1.38 * \text{Origination-Year-Dummy} \\ & +0.15 * \text{Time-To-Default} \\ & -0.0021 * (\text{Time-to-Default})^2 \\ & -4.03 * \text{Tranche-Size} \\ & -0.92 * \text{Default-Date-Balance} \end{aligned}$$

The sign on the origination-year dummy variable is significantly negative, meaning that LGD rates have been significantly lower on tranches originated in or after 1998 than those before 1998. All other variables in the equation are also significant and similar to what was reported in our previous LGD study. This latest model has a R-square of 35%.

With the expanded data sample and improved static model, the parameters in the dynamic and blended LGD projection models were also revised. Specifically, the loss deceleration parameter “beta”, which measures how the future loss as a share of a tranche's current remaining principal balance is related to the accumulated loss to date as a share of principal balance reduced since default date, was revised down from 0.39 to 0.33.

The weight variable “alpha”, which puts weight on the LGD rate projected by the static model and the LGD rates projected by the dynamic model in a blended loss projection framework, was revised up to 0.08 from 0.053. We left unchanged the length of the period, 12-month, during which the static-model-based LGD rates get a non-zero weight.

#### *Analyzing Loss Severity Rates and Time from Origination to Initial Default*

For transactions with amortizing assets, tranches that default late in their lives tend to experience low loss severity (from the perspective of an investor who holds a security since issuance) because of principal and interest payments made prior to the default and the discounting of distant losses. Conversely, for transactions that do not amortize, at least in the first several years after origination, the impact of the length of time to default on expected final loss severity is limited only to discounting of future losses. Figure 28 presents two scatter plots of LGD rates versus the number of months from origination to default — one for RMBS/HEL securities which tend to amortize quickly and one for CDOs which typically do not begin to amortize for a number of years after original issuance.

---

18. We also tested different cut-off issuance years and found 1998 to be the most important. We note that this coincides with the fact that 132 of the 141 RMBS defaults, or 94%, were issued before 1998. But about half of the HEL defaults were observed after 1998.

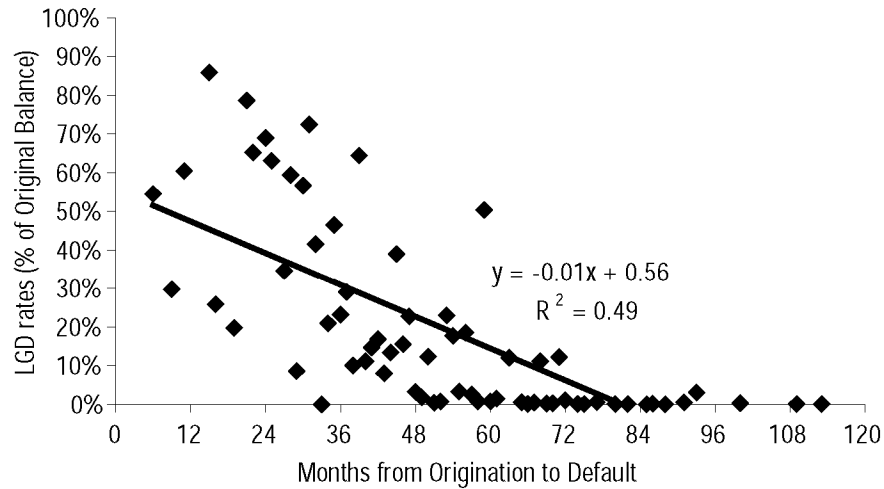
19. Time-to-Default is measured by the number of months from origination to default. Tranche-size is the tranche's original balance as a share of total original balance of the deal. Default-date-balance is the remaining principal balance at the time of default as a share of tranche's original balance.



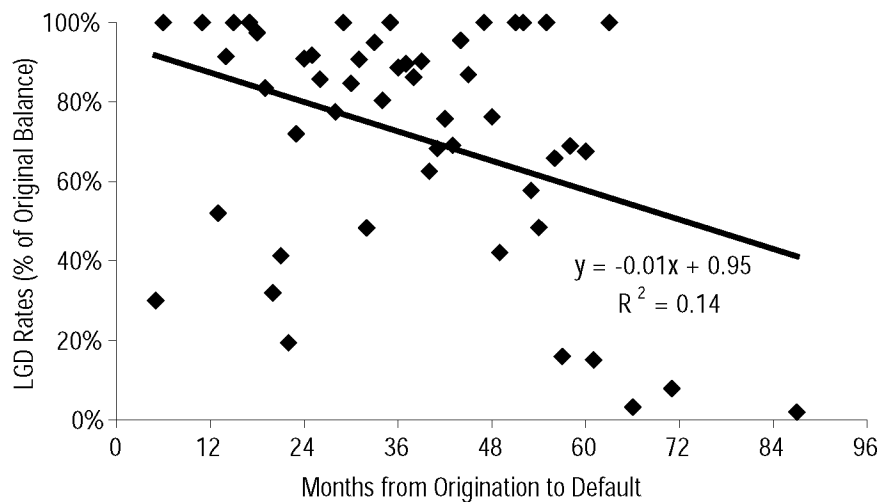
Figure 28

## Relationship between Estimated LGD Rates and Time to Default

### Panel I: For Impaired RMBS and HEL Securities



### Panel II: For Impaired CDO Securities



Panel I shows how the LGD rates of impaired RMBS and HEL tranches decline significantly with time to default. The longer it takes after origination for a tranche to experience a default, the lower the final LGD rate. A linear trend line in the first panel shows a strong relationship between the LGD rates and months from origination to default with an R-square of about 50%. Furthermore, the trend line suggests that any tranches that defaulted five years after origination had virtually no meaningful economic loss.

By contrast, while similar in slope (-0.01), the declining trend in LGD rates of CDOs was much weaker with an R-square of only 14%. Also, because the overall levels of LGD rates on CDOs were much higher than those on RMBS and HEL, the trend line in the second panel of Figure 28 suggests that a CDO tranche would still sustain a material loss economically even if it defaults seven years after origination.

Both the levels and the seasoning patterns of LGD rates directly affect multi-year cumulative LGD rates, which are essential inputs to the derivation of multi-year cumulative loss rates.

### ***Estimating Multi-Year Cumulative LGD Rates***

The concept of multi-year cumulative LGD rate can best be explained by example. Suppose we know the average loss severity (as a percent of the cohort-date balance) of securities that were rated single-B two years before they defaulted and those rated single-B one year before they defaulted. We will call these loss severity values marginal loss severity rates. To calculate the average loss severity rates of the single-B rated securities that defaulted within two years (either in year 1 or year 2) one needs to take a weighted average of the one-year and the two-year marginal severity rates, where the weights are the shares of the two-year cumulative default rates attributable to year 1 and year 2. Figure 29 gives a concrete example.

*Figure 29*

**An Example for Calculating a Two-Year Cumulative LGD Rate**

| Year 1                      |                      |           | Year 2                           |                      |           |
|-----------------------------|----------------------|-----------|----------------------------------|----------------------|-----------|
| At the beginning of year 1  | At the end of year 1 |           | At the beginning of year 2       | At the end of year 2 |           |
| Number of Securities Issued | Impaired             | Withdrawn | Number of Outstanding Securities | Impaired             | Withdrawn |
| 100                         | 5 (LGD=30%)          | 0         | 95                               | 6 (LGD=50%)          | 89        |

The example shows five securities default in the first year, and all have a loss rate of 30% as a share of balance at the beginning of year 1. Six securities default in the second year, and all have a loss rate of 50%, also expressed as a share of principal balance at the beginning of year 1.

In the example, the one-year impairment rate is 5%, and the two-year cumulative impairment rate is  $1 - (1 - 5\%)^2 = 9.75\%$ , or 9.75%. The two-year cumulative LGD rate is:  $(5\% * 30\% + 9.75\% * 50\%) / 9.75\% = 43.9\%$ , which measures the average LGD rate over a two-year period, assuming no knowledge about the timing of defaults at the beginning of year 1.

The two-year cumulative loss rate is the product of the two-year cumulative default rate and the two-year cumulative LGD rate, i.e.  $9.75\% * 43.9\% = 4.28\%$ .

## Appendix 3

### Impairment Rates and Loss Rates by Sector and Rating

*Figure 30*  
**Multi-Year Cumulative Impairment Rates by Sector and by Cohort Rating, 1993-2004**

| All Structured Finance | 1-Year        | 2-Year        | 3-Year        | 4-Year        | 5-Year        |
|------------------------|---------------|---------------|---------------|---------------|---------------|
| Aaa                    | 0.02%         | 0.08%         | 0.21%         | 0.36%         | 0.48%         |
| Aa                     | 0.28%         | 0.76%         | 1.63%         | 2.67%         | 3.51%         |
| A                      | 0.31%         | 1.25%         | 2.29%         | 3.20%         | 3.88%         |
| Baa                    | 1.65%         | 4.61%         | 8.63%         | 12.17%        | 15.71%        |
| Ba                     | 4.84%         | 11.06%        | 16.60%        | 21.33%        | 24.60%        |
| B                      | 7.39%         | 14.55%        | 21.56%        | 26.97%        | 31.25%        |
| Caa                    | 30.81%        | 44.85%        | 53.52%        | 64.33%        | 72.82%        |
| Investment-Grade       | 0.49%         | 1.45%         | 2.77%         | 4.00%         | 5.16%         |
| Speculative-Grade      | 6.78%         | 13.56%        | 19.63%        | 24.75%        | 28.48%        |
| All                    | 1.24%         | 2.91%         | 4.79%         | 6.50%         | 7.97%         |
| <b>US ABS</b>          | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-Year</b> |
| Aaa                    | 0.04%         | 0.12%         | 0.30%         | 0.45%         | 0.65%         |
| Aa                     | 0.82%         | 2.20%         | 4.50%         | 7.28%         | 9.82%         |
| A                      | 0.36%         | 1.66%         | 3.16%         | 4.55%         | 5.75%         |
| Baa                    | 2.08%         | 6.11%         | 12.16%        | 18.51%        | 26.57%        |
| Ba                     | 12.54%        | 27.86%        | 40.18%        | 53.49%        | 62.62%        |
| B                      | 21.64%        | 37.91%        | 49.20%        | 55.25%        | 60.46%        |
| Caa                    | 54.55%        | 70.49%        | 70.49%        |               |               |
| Investment-Grade       | 0.64%         | 1.99%         | 3.93%         | 6.01%         | 8.45%         |
| Speculative-Grade      | 17.56%        | 32.91%        | 44.53%        | 55.65%        | 63.51%        |
| All                    | 1.69%         | 3.92%         | 6.50%         | 9.25%         | 12.13%        |
| <b>US CMBS</b>         | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-Year</b> |
| Aaa                    | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| Aa                     | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| A                      | 0.05%         | 0.28%         | 0.62%         | 0.62%         | 0.62%         |
| Baa                    | 0.39%         | 0.92%         | 1.24%         | 1.37%         | 1.37%         |
| Ba                     | 0.75%         | 1.65%         | 2.63%         | 3.46%         | 3.95%         |
| B                      | 3.30%         | 7.95%         | 14.34%        | 21.64%        | 29.10%        |
| Caa                    | 12.70%        | 26.04%        | 41.29%        | 60.16%        | 76.76%        |
| Investment-Grade       | 0.15%         | 0.39%         | 0.59%         | 0.63%         | 0.63%         |
| Speculative-Grade      | 2.42%         | 5.63%         | 9.92%         | 15.05%        | 20.21%        |
| All                    | 0.77%         | 1.81%         | 3.10%         | 4.49%         | 5.81%         |
| <b>US RMBS</b>         | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-Year</b> |
| Aaa                    | 0.01%         | 0.09%         | 0.26%         | 0.48%         | 0.59%         |
| Aa                     | 0.02%         | 0.10%         | 0.28%         | 0.48%         | 0.53%         |
| A                      | 0.29%         | 0.84%         | 1.12%         | 1.19%         | 1.28%         |
| Baa                    | 1.04%         | 2.69%         | 4.70%         | 6.22%         | 7.31%         |
| Ba                     | 2.28%         | 4.76%         | 7.00%         | 8.62%         | 9.83%         |
| B                      | 3.91%         | 7.65%         | 11.07%        | 12.87%        | 14.01%        |
| Caa                    | 27.50%        | 36.20%        | 39.74%        | 44.38%        | 44.38%        |
| Investment-Grade       | 0.25%         | 0.71%         | 1.26%         | 1.72%         | 2.01%         |
| Speculative-Grade      | 3.21%         | 6.22%         | 8.86%         | 10.59%        | 11.76%        |
| All                    | 0.61%         | 1.39%         | 2.21%         | 2.83%         | 3.24%         |

Figure 30

**Multi-Year Cumulative Impairment Rates by Sector and by Cohort Rating, 1993-2004**

| US ABS (excl. both MH and HEL) |                   | 1-Year | 2-Year  | 3-Year | 4-Year | 5-Year |
|--------------------------------|-------------------|--------|---------|--------|--------|--------|
|                                | Aaa               | 0.06%  | 0.16%   | 0.32%  | 0.45%  | 0.67%  |
|                                | Aa                | 1.07%  | 2.51%   | 4.61%  | 6.84%  | 9.16%  |
|                                | A                 | 0.14%  | 0.76%   | 1.52%  | 2.31%  | 2.72%  |
|                                | Baa               | 1.04%  | 3.45%   | 6.44%  | 9.17%  | 11.27% |
|                                | Ba                | 6.56%  | 17.92%  | 28.53% | 36.73% | 43.66% |
|                                | B                 | 26.02% | 44.07%  | 52.20% | 52.20% | 52.20% |
|                                | Caa               | 39.08% | 54.00%  | 54.00% |        |        |
|                                | Investment-Grade  | 0.27%  | 0.89%   | 1.69%  | 2.45%  | 3.04%  |
|                                | Speculative-Grade | 14.58% | 27.43%  | 37.03% | 43.19% | 48.41% |
|                                | All               | 0.89%  | 1.95%   | 3.00%  | 3.91%  | 4.61%  |
| US RMBS & HEL                  |                   | 1-Year | 2-Year  | 3-Year | 4-Year | 5-Year |
|                                | Aaa               | 0.01%  | 0.07%   | 0.21%  | 0.41%  | 0.50%  |
|                                | Aa                | 0.01%  | 0.07%   | 0.21%  | 0.37%  | 0.42%  |
|                                | A                 | 0.20%  | 0.72%   | 1.24%  | 1.59%  | 1.79%  |
|                                | Baa               | 1.04%  | 2.73%   | 4.99%  | 7.18%  | 8.84%  |
|                                | Ba                | 3.02%  | 6.93%   | 10.89% | 13.36% | 15.70% |
|                                | B                 | 5.05%  | 10.22%  | 15.44% | 18.70% | 21.03% |
|                                | Caa               | 43.10% | 53.64%  | 56.22% | 59.58% | 59.58% |
|                                | Investment-Grade  | 0.27%  | 0.76%   | 1.41%  | 2.06%  | 2.50%  |
|                                | Speculative-Grade | 4.35%  | 8.79%   | 13.13% | 15.87% | 18.16% |
|                                | All               | 0.70%  | 1.65%   | 2.76%  | 3.67%  | 4.36%  |
| US HEL                         |                   | 1-Year | 2-Year  | 3-Year | 4-Year | 5-Year |
|                                | Aaa               | 0.00%  | 0.00%   | 0.00%  | 0.00%  | 0.00%  |
|                                | Aa                | 0.00%  | 0.00%   | 0.00%  | 0.00%  | 0.00%  |
|                                | A                 | 0.08%  | 0.56%   | 1.52%  | 2.54%  | 3.11%  |
|                                | Baa               | 1.04%  | 2.81%   | 5.70%  | 10.05% | 14.09% |
|                                | Ba                | 5.55%  | 14.56%  | 25.05% | 31.40% | 40.02% |
|                                | B                 | 10.97% | 22.71%  | 35.11% | 44.31% | 51.82% |
|                                | Caa               | 77.78% | 100.00% |        |        |        |
|                                | Investment-Grade  | 0.31%  | 0.88%   | 1.87%  | 3.28%  | 4.53%  |
|                                | Speculative-Grade | 8.74%  | 18.68%  | 29.57% | 36.80% | 44.93% |
|                                | All               | 0.90%  | 2.31%   | 4.37%  | 6.52%  | 8.77%  |
| Global CDOs                    |                   | 1-Year | 2-Year  | 3-Year | 4-Year | 5-Year |
|                                | Aaa               | 0.00%  | 0.00%   | 0.00%  | 0.00%  | 0.00%  |
|                                | Aa                | 0.10%  | 0.33%   | 1.23%  | 2.96%  | 5.23%  |
|                                | A                 | 0.79%  | 2.63%   | 5.48%  | 9.64%  | 11.86% |
|                                | Baa               | 3.76%  | 10.90%  | 21.04% | 29.30% | 35.69% |
|                                | Ba                | 6.69%  | 16.16%  | 26.02% | 31.23% | 35.89% |
|                                | B                 | 16.10% | 32.99%  | 48.72% | 60.56% | 68.72% |
|                                | Caa               | 30.14% | 55.29%  |        |        |        |
|                                | Investment-Grade  | 1.28%  | 3.93%   | 7.94%  | 11.84% | 15.22% |
|                                | Speculative-Grade | 10.14% | 21.70%  | 32.98% | 40.67% | 47.41% |
|                                | All               | 2.84%  | 7.10%   | 12.41% | 16.96% | 20.83% |

Figure 30

**Multi-Year Cumulative Impairment Rates by Sector and by Cohort Rating, 1993-2004**

| <b>European Structured Finance (excl. CDOs)</b>         |  | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-Year</b> |
|---|--|---------------|---------------|---------------|---------------|---------------|
| Aaa   |  | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| Aa  |  | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| A   |  | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| Baa   |  | 0.12%         | 0.30%         | 0.30%         | 0.30%         | 0.30%         |
| Ba  |  | 0.00%         | 0.79%         | 2.11%         | 2.11%         | 2.11%         |
| B   |  | 6.45%         | 6.45%         | 6.45%         | 6.45%         | 6.45%         |
| Caa   |  | 0.00%         | 0.00%         |               |               |               |
| Investment-Grade  |  | 0.02%         | 0.05%         | 0.05%         | 0.05%         | 0.05%         |
| Speculative-Grade                                       |  | 0.46%         | 1.19%         | 2.40%         | 2.40%         | 2.40%         |
| All   |  | 0.04%         | 0.09%         | 0.14%         | 0.14%         | 0.14%         |
| <b>Structured Finance in Other Regions (excl. CDOs)</b> |  | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-Year</b> |
| Aaa   |  | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| Aa  |  | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| A   |  | 0.00%         | 0.28%         | 0.28%         | 0.28%         | 0.28%         |
| Baa   |  | 0.33%         | 0.33%         | 0.33%         | 0.33%         | 0.33%         |
| Ba  |  | 0.00%         | 0.83%         | 2.45%         | 5.99%         | 15.89%        |
| B   |  | 1.18%         | 1.18%         | 1.18%         | 1.18%         | 1.18%         |
| Caa   |  | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| Investment-Grade  |  | 0.06%         | 0.10%         | 0.10%         | 0.10%         | 0.10%         |
| Speculative-Grade                                       |  | 0.33%         | 0.91%         | 2.05%         | 4.67%         | 12.29%        |
| All   |  | 0.08%         | 0.17%         | 0.24%         | 0.39%         | 0.71%         |

Figure 31

**Multi-Year Cumulative Impairment Rates by Sector and by Original Rating, 1993-2004**

| All Structured Finance |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year |
|------------------------|-------------------|--------|--------|--------|--------|--------|
|                        | Aaa               | 0.00%  | 0.05%  | 0.12%  | 0.28%  | 0.62%  |
|                        | Aa                | 0.08%  | 0.31%  | 0.67%  | 1.70%  | 3.19%  |
|                        | A                 | 0.04%  | 0.28%  | 1.11%  | 2.28%  | 3.23%  |
|                        | Baa               | 0.05%  | 0.94%  | 3.98%  | 7.91%  | 11.04% |
|                        | Ba                | 0.25%  | 2.88%  | 7.63%  | 12.63% | 16.04% |
|                        | B                 | 0.35%  | 2.64%  | 9.08%  | 16.29% | 22.38% |
|                        | Investment-Grade  | 0.04%  | 0.37%  | 1.35%  | 2.77%  | 4.10%  |
|                        | Speculative-Grade | 0.30%  | 2.80%  | 8.07%  | 13.77% | 18.29% |
|                        | All               | 0.07%  | 0.63%  | 2.13%  | 4.06%  | 5.78%  |
| US ABS                 |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year |
|                        | Aaa               | 0.00%  | 0.10%  | 0.28%  | 0.52%  | 0.87%  |
|                        | Aa                | 0.25%  | 0.98%  | 2.10%  | 3.94%  | 7.79%  |
|                        | A                 | 0.03%  | 0.30%  | 1.30%  | 3.03%  | 4.53%  |
|                        | Baa               | 0.03%  | 0.78%  | 3.85%  | 7.66%  | 12.83% |
|                        | Ba                | 0.62%  | 8.64%  | 19.26% | 29.58% | 39.74% |
|                        | B                 | 2.86%  | 10.57% | 29.49% | 44.94% | 47.14% |
|                        | Investment-Grade  | 0.06%  | 0.46%  | 1.59%  | 3.19%  | 5.32%  |
|                        | Speculative-Grade | 1.08%  | 9.02%  | 21.05% | 32.45% | 40.76% |
|                        | All               | 0.10%  | 0.82%  | 2.50%  | 4.58%  | 7.06%  |
| US CMBS                |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year |
|                        | Aaa               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
|                        | Aa                | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
|                        | A                 | 0.00%  | 0.00%  | 0.66%  | 0.66%  | 0.66%  |
|                        | Baa               | 0.00%  | 0.53%  | 1.41%  | 1.62%  | 1.62%  |
|                        | Ba                | 0.16%  | 0.16%  | 0.68%  | 2.56%  | 3.75%  |
|                        | B                 | 0.18%  | 0.64%  | 2.69%  | 8.01%  | 16.62% |
|                        | Investment-Grade  | 0.00%  | 0.20%  | 0.70%  | 0.77%  | 0.77%  |
|                        | Speculative-Grade | 0.17%  | 0.38%  | 1.72%  | 5.31%  | 10.79% |
|                        | All               | 0.05%  | 0.25%  | 0.99%  | 2.06%  | 3.62%  |
| US RMBS                |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year |
|                        | Aaa               | 0.00%  | 0.05%  | 0.05%  | 0.27%  | 1.02%  |
|                        | Aa                | 0.00%  | 0.00%  | 0.00%  | 1.26%  | 1.45%  |
|                        | A                 | 0.00%  | 0.00%  | 0.67%  | 1.20%  | 1.20%  |
|                        | Baa               | 0.08%  | 0.73%  | 2.28%  | 6.71%  | 8.45%  |
|                        | Ba                | 0.00%  | 0.41%  | 1.73%  | 5.60%  | 6.05%  |
|                        | B                 | 0.28%  | 1.63%  | 8.00%  | 11.11% | 14.93% |
|                        | Investment-Grade  | 0.01%  | 0.16%  | 0.58%  | 1.98%  | 2.67%  |
|                        | Speculative-Grade | 0.11%  | 0.87%  | 4.04%  | 7.63%  | 9.15%  |
|                        | All               | 0.03%  | 0.25%  | 1.07%  | 2.78%  | 3.59%  |

Figure 31

**Multi-Year Cumulative Impairment Rates by Sector and by Original Rating, 1993-2004**

| US ABS (excl. both MH and HEL) |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year |
|--------------------------------|-------------------|--------|--------|--------|--------|--------|
|                                | Aaa               | 0.00%  | 0.17%  | 0.37%  | 0.71%  | 0.95%  |
|                                | Aa                | 1.23%  | 3.04%  | 4.89%  | 7.30%  | 11.64% |
|                                | A                 | 0.06%  | 0.34%  | 1.13%  | 2.11%  | 2.94%  |
|                                | Baa               | 0.16%  | 1.17%  | 4.83%  | 6.81%  | 8.43%  |
|                                | Ba                | 0.59%  | 6.93%  | 15.63% | 26.27% | 32.33% |
|                                | B                 | 0.00%  | 10.00% | 46.00% | 54.31% | 54.31% |
|                                | Investment-Grade  | 0.15%  | 0.60%  | 1.56%  | 2.48%  | 3.39%  |
|                                | Speculative-Grade | 1.02%  | 7.74%  | 19.74% | 29.93% | 35.00% |
|                                | All               | 0.19%  | 0.88%  | 2.25%  | 3.43%  | 4.47%  |
| US RMBS & HEL                  |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year |
|                                | Aaa               | 0.00%  | 0.03%  | 0.03%  | 0.19%  | 0.76%  |
|                                | Aa                | 0.00%  | 0.00%  | 0.00%  | 0.82%  | 0.95%  |
|                                | A                 | 0.00%  | 0.05%  | 0.48%  | 1.15%  | 1.71%  |
|                                | Baa               | 0.03%  | 0.39%  | 1.42%  | 5.08%  | 7.57%  |
|                                | Ba                | 0.00%  | 0.65%  | 3.09%  | 8.02%  | 10.82% |
|                                | B                 | 0.75%  | 2.51%  | 9.48%  | 16.18% | 19.86% |
|                                | Investment-Grade  | 0.01%  | 0.12%  | 0.44%  | 1.65%  | 2.54%  |
|                                | Speculative-Grade | 0.24%  | 1.28%  | 5.28%  | 10.77% | 13.84% |
|                                | All               | 0.03%  | 0.23%  | 0.96%  | 2.67%  | 3.85%  |
| US HEL                         |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year |
|                                | Aaa               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
|                                | Aa                | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
|                                | A                 | 0.00%  | 0.10%  | 0.27%  | 1.08%  | 2.35%  |
|                                | Baa               | 0.00%  | 0.15%  | 0.61%  | 3.25%  | 6.99%  |
|                                | Ba                | 0.00%  | 1.50%  | 7.80%  | 15.87% | 26.88% |
|                                | B                 | 4.65%  | 9.30%  | 19.38% | 38.19% | 41.13% |
|                                | Investment-Grade  | 0.00%  | 0.07%  | 0.24%  | 1.13%  | 2.45%  |
|                                | Speculative-Grade | 0.65%  | 2.93%  | 10.27% | 21.69% | 30.10% |
|                                | All               | 0.03%  | 0.19%  | 0.79%  | 2.50%  | 4.50%  |
| Global CDOs                    |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year |
|                                | Aaa               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
|                                | Aa                | 0.00%  | 0.00%  | 0.00%  | 0.29%  | 1.67%  |
|                                | A                 | 0.10%  | 0.73%  | 2.23%  | 4.29%  | 6.50%  |
|                                | Baa               | 0.16%  | 2.30%  | 10.09% | 19.53% | 25.06% |
|                                | Ba                | 0.37%  | 5.26%  | 14.76% | 20.96% | 25.56% |
|                                | B                 | 0.00%  | 12.05% | 30.56% | 47.54% | 53.16% |
|                                | Investment-Grade  | 0.06%  | 0.76%  | 3.33%  | 6.66%  | 9.09%  |
|                                | Speculative-Grade | 0.32%  | 6.32%  | 17.37% | 25.78% | 30.88% |
|                                | All               | 0.09%  | 1.45%  | 5.26%  | 9.46%  | 12.34% |

Figure 31

**Multi-Year Cumulative Impairment Rates by Sector and by Original Rating, 1993-2004**

| European Structured Finance (excl. CDOs)         | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year |
|--|--------|--------|--------|--------|--------|
| Aaa  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| Aa   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| A  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| Baa  | 0.00%  | 0.30%  | 0.30%  | 0.30%  | 0.30%  |
| Ba   | 0.00%  | 0.00%  | 0.00%  | 3.28%  | 3.28%  |
| B  |        |        |        |        |        |
| Investment-Grade                                 | 0.00%  | 0.06%  | 0.06%  | 0.06%  | 0.06%  |
| Speculative-Grade                                | 0.00%  | 0.00%  | 0.00%  | 3.17%  | 3.17%  |
| All  | 0.00%  | 0.05%  | 0.05%  | 0.16%  | 0.16%  |
| Structured Finance in Other Regions (excl. CDOs) | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year |
| Aaa  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| Aa   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| A  | 0.31%  | 0.74%  | 0.74%  | 0.74%  | 0.74%  |
| Baa  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| Ba   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| B  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| Investment-Grade                                 | 0.05%  | 0.13%  | 0.13%  | 0.13%  | 0.13%  |
| Speculative-Grade                                | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| All  | 0.05%  | 0.12%  | 0.12%  | 0.12%  | 0.12%  |



Figure 32

**Estimated Multi-Year Cumulative Loss Rates by Sector and by Cohort Rating, 1993-2004\***

| <b>All Structured Finance</b> |                   | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-Year</b> |
|-------------------------------|-------------------|---------------|---------------|---------------|---------------|---------------|
|                               | Aaa               | 0.00%         | 0.01%         | 0.02%         | 0.03%         | 0.04%         |
|                               | Aa                | 0.05%         | 0.22%         | 0.54%         | 0.92%         | 1.21%         |
|                               | A                 | 0.17%         | 0.65%         | 1.09%         | 1.37%         | 1.41%         |
|                               | Baa               | 0.99%         | 2.68%         | 4.70%         | 6.08%         | 7.15%         |
|                               | Ba                | 2.94%         | 6.31%         | 8.89%         | 10.69%        | 11.84%        |
|                               | B                 | 4.54%         | 9.26%         | 13.65%        | 16.57%        | 18.01%        |
|                               | Caa               | 18.90%        | 23.50%        | 24.20%        | 25.02%        | 25.02%        |
|                               | Investment-Grade  | 0.29%         | 0.83%         | 1.47%         | 1.94%         | 2.27%         |
|                               | Speculative-Grade | 4.20%         | 8.13%         | 11.34%        | 13.71%        | 15.00%        |
|                               | All               | 0.76%         | 1.71%         | 2.66%         | 3.36%         | 3.82%         |
| <b>US ABS</b>                 |                   | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-Year</b> |
|                               | Aaa               | 0.00%         | 0.01%         | 0.02%         | 0.03%         | 0.05%         |
|                               | Aa                | 0.16%         | 0.62%         | 1.49%         | 2.50%         | 3.36%         |
|                               | A                 | 0.20%         | 0.86%         | 1.49%         | 1.92%         | 1.99%         |
|                               | Baa               | 1.26%         | 3.55%         | 6.59%         | 9.07%         | 11.49%        |
|                               | Ba                | 7.62%         | 15.93%        | 21.67%        | 26.72%        | 29.93%        |
|                               | B                 | 13.29%        | 24.02%        | 31.09%        | 34.35%        | 36.11%        |
|                               | Caa               | 33.46%        | 38.69%        | 38.69%        |               |               |
|                               | Investment-Grade  | 0.38%         | 1.13%         | 2.08%         | 2.88%         | 3.57%         |
|                               | Speculative-Grade | 10.88%        | 19.78%        | 25.92%        | 31.07%        | 33.78%        |
|                               | All               | 1.03%         | 2.30%         | 3.61%         | 4.74%         | 5.62%         |
| <b>US CMBS</b>                |                   | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-Year</b> |
|                               | Aaa               | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
|                               | Aa                | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
|                               | A                 | 0.02%         | 0.13%         | 0.28%         | 0.28%         | 0.28%         |
|                               | Baa               | 0.18%         | 0.41%         | 0.52%         | 0.56%         | 0.56%         |
|                               | Ba                | 0.31%         | 0.64%         | 0.95%         | 1.23%         | 1.38%         |
|                               | B                 | 1.85%         | 4.66%         | 8.17%         | 11.51%        | 13.54%        |
|                               | Caa               | 6.94%         | 10.05%        | 12.51%        | 15.34%        | 15.34%        |
|                               | Investment-Grade  | 0.07%         | 0.17%         | 0.24%         | 0.25%         | 0.25%         |
|                               | Speculative-Grade | 1.20%         | 2.65%         | 4.38%         | 6.33%         | 7.81%         |
|                               | All               | 0.37%         | 0.83%         | 1.32%         | 1.76%         | 2.07%         |
| <b>US RMBS</b>                |                   | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-Year</b> |
|                               | Aaa               | 0.00%         | 0.01%         | 0.04%         | 0.08%         | 0.09%         |
|                               | Aa                | 0.00%         | 0.03%         | 0.13%         | 0.27%         | 0.31%         |
|                               | A                 | 0.13%         | 0.40%         | 0.52%         | 0.53%         | 0.55%         |
|                               | Baa               | 0.47%         | 1.19%         | 1.90%         | 2.29%         | 2.51%         |
|                               | Ba                | 0.96%         | 1.86%         | 2.56%         | 3.11%         | 3.47%         |
|                               | B                 | 2.20%         | 4.45%         | 6.33%         | 7.15%         | 7.46%         |
|                               | Caa               | 15.03%        | 17.06%        | 17.63%        | 18.33%        | 18.33%        |
|                               | Investment-Grade  | 0.11%         | 0.31%         | 0.50%         | 0.63%         | 0.69%         |
|                               | Speculative-Grade | 1.60%         | 2.95%         | 4.01%         | 4.67%         | 5.01%         |
|                               | All               | 0.29%         | 0.64%         | 0.95%         | 1.15%         | 1.24%         |

Figure 32

**Estimated Multi-Year Cumulative Loss Rates by Sector and by Cohort Rating, 1993-2004\***

| US ABS (excl. both MH and HEL) |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year |
|--------------------------------|-------------------|--------|--------|--------|--------|--------|
|                                | Aaa               | 0.00%  | 0.01%  | 0.02%  | 0.03%  | 0.05%  |
|                                | Aa                | 0.21%  | 0.69%  | 1.49%  | 2.30%  | 3.08%  |
|                                | A                 | 0.08%  | 0.39%  | 0.71%  | 0.96%  | 0.98%  |
|                                | Baa               | 0.63%  | 2.00%  | 3.50%  | 4.57%  | 5.20%  |
|                                | Ba                | 3.99%  | 10.15% | 15.09% | 18.20% | 20.64% |
|                                | B                 | 15.98% | 27.88% | 32.98% | 32.98% | 32.98% |
|                                | Caa               | 23.98% | 28.87% | 28.87% |        |        |
|                                | Investment-Grade  | 0.16%  | 0.51%  | 0.90%  | 1.19%  | 1.36%  |
|                                | Speculative-Grade | 9.04%  | 16.48% | 21.55% | 24.40% | 26.21% |
|                                | All               | 0.54%  | 1.15%  | 1.68%  | 2.05%  | 2.27%  |
| US RMBS & HEL                  |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year |
|                                | Aaa               | 0.00%  | 0.01%  | 0.04%  | 0.07%  | 0.08%  |
|                                | Aa                | 0.00%  | 0.02%  | 0.10%  | 0.22%  | 0.25%  |
|                                | A                 | 0.09%  | 0.34%  | 0.56%  | 0.65%  | 0.67%  |
|                                | Baa               | 0.47%  | 1.21%  | 2.00%  | 2.58%  | 2.91%  |
|                                | Ba                | 1.27%  | 2.70%  | 3.93%  | 4.77%  | 5.46%  |
|                                | B                 | 2.84%  | 5.95%  | 8.82%  | 10.31% | 10.95% |
|                                | Caa               | 23.56% | 26.01% | 26.43% | 26.94% | 26.94% |
|                                | Investment-Grade  | 0.12%  | 0.33%  | 0.56%  | 0.74%  | 0.83%  |
|                                | Speculative-Grade | 2.16%  | 4.16%  | 5.91%  | 6.95%  | 7.61%  |
|                                | All               | 0.34%  | 0.76%  | 1.18%  | 1.47%  | 1.63%  |
| US HEL                         |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year |
|                                | Aaa               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
|                                | Aa                | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
|                                | A                 | 0.04%  | 0.27%  | 0.68%  | 0.92%  | 0.99%  |
|                                | Baa               | 0.47%  | 1.24%  | 2.26%  | 3.40%  | 4.20%  |
|                                | Ba                | 2.33%  | 5.62%  | 8.88%  | 11.04% | 13.59% |
|                                | B                 | 6.16%  | 13.23% | 20.06% | 24.27% | 26.31% |
|                                | Caa               | 42.51% | 47.69% |        |        |        |
|                                | Investment-Grade  | 0.14%  | 0.38%  | 0.74%  | 1.13%  | 1.38%  |
|                                | Speculative-Grade | 4.35%  | 8.81%  | 13.20% | 15.95% | 18.29% |
|                                | All               | 0.43%  | 1.05%  | 1.84%  | 2.52%  | 3.04%  |
| Global CDOs                    |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year |
|                                | Aaa               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
|                                | Aa                | 0.04%  | 0.12%  | 0.26%  | 0.29%  | 0.32%  |
|                                | A                 | 0.53%  | 1.48%  | 2.69%  | 4.24%  | 4.24%  |
|                                | Baa               | 2.86%  | 7.86%  | 14.50% | 18.78% | 21.35% |
|                                | Ba                | 5.33%  | 12.13% | 18.25% | 20.44% | 22.34% |
|                                | B                 | 10.73% | 22.85% | 33.89% | 41.24% | 44.51% |
|                                | Caa               | 20.51% | 31.14% |        |        |        |
|                                | Investment-Grade  | 0.96%  | 2.76%  | 5.26%  | 7.16%  | 8.41%  |
|                                | Speculative-Grade | 7.53%  | 15.73% | 23.10% | 27.29% | 30.02% |
|                                | All               | 2.11%  | 5.08%  | 8.44%  | 10.73% | 12.22% |

\* Loss rates are calculated by multiplying cumulative material impairments rates by estimated cumulative LGD rates for each cohort rating category and time horizon. LGD rates are model-derived for RMBS/HEL securities and CDOs. Cumulative LGD rates in the CMBS, RMBS, and HEL sectors are based on estimated cumulative LGD rates in the RMBS/HEL sector. Cumulative LGD rates in the all structured finance, US ABS, non-HEL and non-MH ABS categories are averages of estimated LGD rates in RMBS/HEL and CDOs.

Figure 33

**Estimated Multi-Year Cumulative Loss Rates by Sector and by Original Rating, 1993-2004\***

| All Structured Finance |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year |
|------------------------|-------------------|--------|--------|--------|--------|--------|
|                        | Aaa               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.01%  |
|                        | Aa                | 0.00%  | 0.00%  | 0.00%  | 0.27%  | 0.38%  |
|                        | A                 | 0.02%  | 0.08%  | 0.48%  | 0.77%  | 1.25%  |
|                        | Baa               | 0.03%  | 0.55%  | 2.43%  | 4.21%  | 5.26%  |
|                        | Ba                | 0.00%  | 1.78%  | 4.60%  | 7.12%  | 8.43%  |
|                        | B                 | 0.10%  | 1.78%  | 7.16%  | 12.38% | 16.38% |
|                        | Investment-Grade  | 0.02%  | 0.21%  | 0.80%  | 1.41%  | 1.84%  |
|                        | Speculative-Grade | 0.08%  | 1.88%  | 5.74%  | 9.21%  | 11.23% |
|                        | All               | 0.04%  | 0.42%  | 1.42%  | 2.36%  | 2.99%  |
| US ABS                 |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year |
|                        | Aaa               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.01%  |
|                        | Aa                | 0.00%  | 0.00%  | 0.00%  | 0.48%  | 0.77%  |
|                        | A                 | 0.01%  | 0.08%  | 0.56%  | 0.99%  | 1.75%  |
|                        | Baa               | 0.02%  | 0.46%  | 2.36%  | 4.08%  | 5.83%  |
|                        | Ba                | 0.00%  | 5.42%  | 11.74% | 16.92% | 20.82% |
|                        | B                 | 0.78%  | 6.45%  | 22.27% | 33.45% | 34.90% |
|                        | Investment-Grade  | 0.03%  | 0.27%  | 0.94%  | 1.62%  | 2.31%  |
|                        | Speculative-Grade | 0.30%  | 6.01%  | 14.82% | 21.75% | 25.47% |
|                        | All               | 0.07%  | 0.55%  | 1.66%  | 2.67%  | 3.58%  |
| US CMBS                |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year |
|                        | Aaa               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
|                        | Aa                | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
|                        | A                 | 0.00%  | 0.00%  | 0.14%  | 0.14%  | 0.14%  |
|                        | Baa               | 0.00%  | 0.32%  | 0.67%  | 0.70%  | 0.70%  |
|                        | Ba                | 0.00%  | 0.00%  | 0.14%  | 0.46%  | 0.68%  |
|                        | B                 | 0.10%  | 0.38%  | 1.76%  | 4.13%  | 6.84%  |
|                        | Investment-Grade  | 0.00%  | 0.12%  | 0.29%  | 0.30%  | 0.30%  |
|                        | Speculative-Grade | 0.09%  | 0.20%  | 0.89%  | 1.93%  | 3.18%  |
|                        | All               | 0.02%  | 0.14%  | 0.47%  | 0.67%  | 0.83%  |
| US RMBS                |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year |
|                        | Aaa               | 0.00%  | 0.00%  | 0.00%  | 0.01%  | 0.02%  |
|                        | Aa                | 0.00%  | 0.00%  | 0.00%  | 0.17%  | 0.19%  |
|                        | A                 | 0.00%  | 0.00%  | 0.15%  | 0.16%  | 0.16%  |
|                        | Baa               | 0.03%  | 0.42%  | 1.04%  | 1.59%  | 1.68%  |
|                        | Ba                | 0.00%  | 0.18%  | 0.52%  | 1.19%  | 1.28%  |
|                        | B                 | 0.15%  | 0.97%  | 5.26%  | 6.64%  | 7.84%  |
|                        | Investment-Grade  | 0.01%  | 0.09%  | 0.24%  | 0.40%  | 0.43%  |
|                        | Speculative-Grade | 0.06%  | 0.47%  | 2.09%  | 3.13%  | 3.48%  |
|                        | All               | 0.01%  | 0.14%  | 0.51%  | 0.82%  | 0.90%  |

Figure 33

**Estimated Multi-Year Cumulative Loss Rates by Sector and by Original Rating, 1993-2004\***

| US ABS (excl. both MH and HEL) |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year |
|--------------------------------|-------------------|--------|--------|--------|--------|--------|
|                                | Aaa               | 0.00%  | 0.00%  | 0.00%  | 0.01%  | 0.01%  |
|                                | Aa                | 0.00%  | 0.00%  | 0.00%  | 0.63%  | 0.96%  |
|                                | A                 | 0.03%  | 0.10%  | 0.47%  | 0.72%  | 1.14%  |
|                                | Baa               | 0.09%  | 0.68%  | 2.94%  | 3.84%  | 4.38%  |
|                                | Ba                | 0.00%  | 4.29%  | 9.46%  | 14.80% | 17.13% |
|                                | B                 | 0.00%  | 7.36%  | 37.45% | 43.46% | 43.46% |
|                                | Investment-Grade  | 0.09%  | 0.35%  | 0.91%  | 1.31%  | 1.61%  |
|                                | Speculative-Grade | 0.28%  | 5.11%  | 13.90% | 20.10% | 22.37% |
|                                | All               | 0.12%  | 0.59%  | 1.49%  | 2.07%  | 2.45%  |
| US RMBS & HEL                  |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year |
|                                | Aaa               | 0.00%  | 0.00%  | 0.00%  | 0.01%  | 0.01%  |
|                                | Aa                | 0.00%  | 0.00%  | 0.00%  | 0.11%  | 0.12%  |
|                                | A                 | 0.00%  | 0.00%  | 0.09%  | 0.11%  | 0.11%  |
|                                | Baa               | 0.01%  | 0.23%  | 0.64%  | 1.09%  | 1.22%  |
|                                | Ba                | 0.00%  | 0.28%  | 0.91%  | 1.77%  | 2.29%  |
|                                | B                 | 0.41%  | 1.48%  | 6.16%  | 9.16%  | 10.31% |
|                                | Investment-Grade  | 0.00%  | 0.07%  | 0.18%  | 0.32%  | 0.35%  |
|                                | Speculative-Grade | 0.13%  | 0.69%  | 2.74%  | 4.33%  | 5.03%  |
|                                | All               | 0.01%  | 0.13%  | 0.45%  | 0.76%  | 0.89%  |
| US HEL                         |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year |
|                                | Aaa               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
|                                | Aa                | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
|                                | A                 | 0.00%  | 0.00%  | 0.04%  | 0.06%  | 0.07%  |
|                                | Baa               | 0.00%  | 0.09%  | 0.28%  | 0.60%  | 0.80%  |
|                                | Ba                | 0.00%  | 0.65%  | 2.28%  | 3.68%  | 5.72%  |
|                                | B                 | 2.55%  | 5.37%  | 12.15% | 20.56% | 21.48% |
|                                | Investment-Grade  | 0.00%  | 0.04%  | 0.10%  | 0.20%  | 0.26%  |
|                                | Speculative-Grade | 0.36%  | 1.58%  | 5.35%  | 8.65%  | 10.57% |
|                                | All               | 0.01%  | 0.11%  | 0.37%  | 0.68%  | 0.90%  |
| Global CDOs                    |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year |
|                                | Aaa               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
|                                | Aa                | 0.00%  | 0.00%  | 0.00%  | 0.11%  | 0.20%  |
|                                | A                 | 0.10%  | 0.40%  | 1.51%  | 2.49%  | 4.70%  |
|                                | Baa               | 0.11%  | 1.37%  | 7.87%  | 15.22% | 18.68% |
|                                | Ba                | 0.00%  | 4.50%  | 13.34% | 18.49% | 21.17% |
|                                | B                 | 0.00%  | 10.41% | 28.93% | 45.90% | 51.52% |
|                                | Investment-Grade  | 0.05%  | 0.45%  | 2.57%  | 5.06%  | 6.54%  |
|                                | Speculative-Grade | 0.00%  | 5.41%  | 15.92% | 23.73% | 27.13% |
|                                | All               | 0.07%  | 1.14%  | 4.48%  | 7.81%  | 9.61%  |

\* Loss rates are calculated by multiplying cumulative material impairments rates by estimated cumulative LGD rates for each original rating category and time horizon. LGD rates are model-derived for RMBS/HEL securities and CDOs. Cumulative LGD rates in the CMBS, RMBS, and HEL sectors are based on estimated cumulative LGD rates in the RMBS/HEL sector. Cumulative LGD rates in the all structured finance, US ABS, non-HEL and non-MH ABS categories are averages of estimated LGD rates in RMBS/HEL and CDOs.

Figure 34

**Global Corporate Cumulative Loss Rates by Cohort Rating, 1982-2004**

| All Corporate     | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year |
|-------------------|--------|--------|--------|--------|--------|
| Aaa               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.05%  |
| Aa                | 0.00%  | 0.00%  | 0.03%  | 0.07%  | 0.12%  |
| A                 | 0.01%  | 0.05%  | 0.14%  | 0.23%  | 0.32%  |
| Baa               | 0.13%  | 0.37%  | 0.59%  | 0.99%  | 1.35%  |
| Ba                | 0.77%  | 2.10%  | 3.76%  | 5.28%  | 6.91%  |
| B                 | 3.58%  | 8.14%  | 12.17% | 15.61% | 19.51% |
| Caa               | 14.18% | 23.79% | 32.30% | 31.58% | 53.06% |
| Investment-Grade  | 0.04%  | 0.13%  | 0.24%  | 0.39%  | 0.55%  |
| Speculative-Grade | 3.25%  | 6.66%  | 9.78%  | 12.03% | 14.88% |
| All               | 1.09%  | 2.22%  | 3.22%  | 3.97%  | 4.82%  |

Figure 35

**Moody's Idealized Loss Rates Table**

| Rating | Horizon  |          |          |          |          |          |          |          |          |          |
|--------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
|        | 1-Year   | 2-Year   | 3-Year   | 4-Year   | 5-Year   | 6-Year   | 7-Year   | 8-Year   | 9-Year   | 10-Year  |
| Aaa    | 0.0000%  | 0.0001%  | 0.0004%  | 0.0010%  | 0.0016%  | 0.0022%  | 0.0029%  | 0.0036%  | 0.0045%  | 0.0055%  |
| Aa1    | 0.0003%  | 0.0017%  | 0.0055%  | 0.0116%  | 0.0171%  | 0.0231%  | 0.0297%  | 0.0369%  | 0.0451%  | 0.0550%  |
| Aa2    | 0.0007%  | 0.0044%  | 0.0143%  | 0.0259%  | 0.0374%  | 0.0490%  | 0.0611%  | 0.0743%  | 0.0902%  | 0.1100%  |
| Aa3    | 0.0017%  | 0.0105%  | 0.0325%  | 0.0556%  | 0.0781%  | 0.1007%  | 0.1249%  | 0.1496%  | 0.1799%  | 0.2200%  |
| A1     | 0.0032%  | 0.0204%  | 0.0644%  | 0.1040%  | 0.1436%  | 0.1815%  | 0.2233%  | 0.2640%  | 0.3152%  | 0.3850%  |
| A2     | 0.0060%  | 0.0385%  | 0.1221%  | 0.1898%  | 0.2569%  | 0.3207%  | 0.3905%  | 0.4560%  | 0.5401%  | 0.6600%  |
| A3     | 0.0214%  | 0.0825%  | 0.1980%  | 0.2970%  | 0.4015%  | 0.5005%  | 0.6105%  | 0.7150%  | 0.8360%  | 0.9900%  |
| Baa1   | 0.0495%  | 0.1540%  | 0.3080%  | 0.4565%  | 0.6050%  | 0.7535%  | 0.9185%  | 1.0835%  | 1.2485%  | 1.4300%  |
| Baa2   | 0.0935%  | 0.2585%  | 0.4565%  | 0.6600%  | 0.8690%  | 1.0835%  | 1.3255%  | 1.5675%  | 1.7820%  | 1.9800%  |
| Baa3   | 0.2310%  | 0.5775%  | 0.9405%  | 1.3090%  | 1.6775%  | 2.0350%  | 2.3815%  | 2.7335%  | 3.0635%  | 3.3550%  |
| Ba1    | 0.4785%  | 1.1110%  | 1.7215%  | 2.3100%  | 2.9040%  | 3.4375%  | 3.8830%  | 4.3395%  | 4.7795%  | 5.1700%  |
| Ba2    | 0.8580%  | 1.9085%  | 2.8490%  | 3.7400%  | 4.6255%  | 5.3735%  | 5.8850%  | 6.4130%  | 6.9575%  | 7.4250%  |
| Ba3    | 1.5455%  | 3.0305%  | 4.3285%  | 5.3845%  | 6.5230%  | 7.4195%  | 8.0410%  | 8.6405%  | 9.1905%  | 9.7130%  |
| B1     | 2.5740%  | 4.6090%  | 6.3690%  | 7.6175%  | 8.8660%  | 9.8395%  | 10.5215% | 11.1265% | 11.6820% | 12.2100% |
| B2     | 3.9380%  | 6.4185%  | 8.5525%  | 9.9715%  | 11.3905% | 12.4575% | 13.2055% | 13.8325% | 14.4210% | 14.9600% |
| B3     | 6.3910%  | 9.1355%  | 11.5665% | 13.2220% | 14.8775% | 16.0600% | 17.0500% | 17.9190% | 18.5790% | 19.1950% |
| Caa1   | 9.5599%  | 12.7788% | 15.7512% | 17.8634% | 19.9726% | 21.4317% | 22.7620% | 24.0113% | 25.1195% | 26.2350% |
| Caa2   | 14.3000% | 17.8750% | 21.4500% | 24.1340% | 26.8125% | 28.6000% | 30.3875% | 32.1750% | 33.9625% | 35.7500% |
| Caa3   | 28.0446% | 31.3548% | 34.3475% | 36.4331% | 38.4017% | 39.6611% | 40.8817% | 42.0669% | 43.2196% | 44.3850% |

## Appendix 4

| A Complete List of New Materially Impaired Structured Finance Securities in 2004* |  |              |                  |        |                 |        |      | Impairment |  |
|---|--|--------------|------------------|--------|-----------------|--------|------|------------|--|
| Tranche Name  | Deal Name  | Closing Date | Deal Type        | Sector | Original rating | Region | Year | Month      |  |
| Class C   | ACLC Business Loan Receivables Trust 2000-1                          | 8/1/00       | Franchise Loans  | ABS    | Aa3             | US     | 2004 | 11         |  |
| Class D   | ACLC Business Loan Receivables Trust 2000-1                          | 8/1/00       | Franchise Loans  | ABS    | A2              | US     | 2004 | 5          |  |
| Class B   | Captec Grantor Trusts 2000-1   | 2/28/00      | Franchise Loans  | ABS    | Aa2             | US     | 2004 | 9          |  |
| Class C-2   | FFCA Secured Franchise Lending Corporation                           | 10/12/99     | Franchise Loans  | ABS    | Aa3             | US     | 2004 | 8          |  |
| Class D-2   | FFCA Secured Franchise Lending Corporation                           | 10/12/99     | Franchise Loans  | ABS    | A1              | US     | 2004 | 8          |  |
| Class E-2   | FFCA Secured Franchise Lending Corporation                           | 10/12/99     | Franchise Loans  | ABS    | A2              | US     | 2004 | 8          |  |
| Class A-2   | Global Franchise Trust 1998-1  | 8/10/98      | Franchise Loans  | ABS    | Aaa             | US     | 2004 | 9          |  |
| Class B   | Global Franchise Trust 1998-1  | 8/10/98      | Franchise Loans  | ABS    | Aa2             | US     | 2004 | 2          |  |
| Class G   | MSDWMC Owner Trust 2000-F1   | 9/15/00      | Franchise Loans  | ABS    | Ba2             | US     | 2004 | 11         |  |
| Class D-2   | AerCo Limited  | 7/17/00      | Aircraft Leases  | ABS    | Ba2             | US     | 2004 | 6          |  |
| Ser. C  | Air 2 US, Series A, B, C, D Enhanced Equipment Notes                 | 11/12/99     | Aircraft Leases  | ABS    | Baa1            | US     | 2004 | 8          |  |
| Class C   | Aircraft Finance Trust, Series 1999-1                                | 5/5/99       | Aircraft Leases  | ABS    | Baa2            | US     | 2004 | 10         |  |
| Class D   | Aircraft Finance Trust, Series 1999-1                                | 5/5/99       | Aircraft Leases  | ABS    | Ba2             | US     | 2004 | 7          |  |
| Class C   | ALPS 96-1  | 6/27/96      | Aircraft Leases  | ABS    | Baa2            | US     | 2004 | 6          |  |
| Class B   | Embarcadero Aircraft Securitization Trust (EAST 2000), Series 2000-1 | 8/25/00      | Aircraft Leases  | ABS    | A2              | US     | 2004 | 3          |  |
| Class C   | Embarcadero Aircraft Securitization Trust (EAST 2000), Series 2000-1 | 8/25/00      | Aircraft Leases  | ABS    | Baa2            | US     | 2004 | 6          |  |
| Class D-2   | Lease Investment Flight Trust (LIFT), Series 2001-1                  | 6/26/01      | Aircraft Leases  | ABS    | Ba2             | US     | 2004 | 7          |  |
| Class C-2   | Triton Aviation Finance  | 6/22/00      | Aircraft Leases  | ABS    | Baa2            | US     | 2004 | 2          |  |
| Class E   | DVI Receivables VIII, L.L.C.   | 7/27/99      | Equipment Leases | ABS    | Ba2             | US     | 2004 | 4          |  |
| Class B   | DVI Receivables X, L.L.C.  | 10/29/99     | Equipment Leases | ABS    | Aa3             | US     | 2004 | 4          |  |
| Class C   | DVI Receivables X, L.L.C.  | 10/29/99     | Equipment Leases | ABS    | A2              | US     | 2004 | 4          |  |
| Class D   | DVI Receivables X, L.L.C.  | 10/29/99     | Equipment Leases | ABS    | Baa2            | US     | 2004 | 4          |  |
| Class E   | DVI Receivables X, L.L.C.  | 10/29/99     | Equipment Leases | ABS    | Ba2             | US     | 2004 | 4          |  |
| Class B   | DVI Receivables XI, L.L.C.   | 5/11/00      | Equipment Leases | ABS    | Aa3             | US     | 2004 | 4          |  |
| Class C   | DVI Receivables XI, L.L.C.   | 5/11/00      | Equipment Leases | ABS    | A2              | US     | 2004 | 4          |  |
| Class D   | DVI Receivables XI, L.L.C.   | 5/11/00      | Equipment Leases | ABS    | Baa2            | US     | 2004 | 4          |  |
| Class E   | DVI Receivables XI, L.L.C.   | 5/11/00      | Equipment Leases | ABS    | Ba2             | US     | 2004 | 4          |  |
| Class B   | DVI Receivables XII, L.L.C.  | 11/16/00     | Equipment Leases | ABS    | Aa3             | US     | 2004 | 4          |  |
| Class C   | DVI Receivables XII, L.L.C.  | 11/16/00     | Equipment Leases | ABS    | A2              | US     | 2004 | 4          |  |
| Class D   | DVI Receivables XII, L.L.C.  | 11/16/00     | Equipment Leases | ABS    | Baa2            | US     | 2004 | 4          |  |
| Class E   | DVI Receivables XII, L.L.C.  | 11/16/00     | Equipment Leases | ABS    | Ba2             | US     | 2004 | 4          |  |
| Class A-3   | DVI Receivables XIV, L.L.C. Series 2001-1                            | 5/10/01      | Equipment Leases | ABS    | Aaa             | US     | 2004 | 7          |  |
| Class C   | DVI Receivables XIV, L.L.C. Series 2001-1                            | 5/10/01      | Equipment Leases | ABS    | A2              | US     | 2004 | 4          |  |

\* Materially impaired private securities are not listed.

## A Complete List of New Materially Impaired Structured Finance Securities in 2004\*

|           |  |          |                      |     |      |    |      |   |
|-----------|--|----------|----------------------|-----|------|----|------|---|
| Class D   | DVI Receivables XIV, L.L.C. Series 2001-1              | 5/10/01  | Equipment Leases     | ABS | Baa2 | US | 2004 | 4 |
| Class E   | DVI Receivables XIV, L.L.C. Series 2001-1              | 5/10/01  | Equipment Leases     | ABS | Ba2  | US | 2004 | 4 |
| Class B   | DVI Receivables XIX, L.L.C. Series 2003-1              | 5/22/03  | Equipment Leases     | ABS | Aa2  | US | 2004 | 4 |
| Class C-2 | DVI Receivables XIX, L.L.C. Series 2003-1              | 5/22/03  | Equipment Leases     | ABS | A1   | US | 2004 | 4 |
| Class D-2 | DVI Receivables XIX, L.L.C. Series 2003-1              | 5/22/03  | Equipment Leases     | ABS | Baa2 | US | 2004 | 4 |
| Class E-2 | DVI Receivables XIX, L.L.C. Series 2003-1              | 5/22/03  | Equipment Leases     | ABS | Ba2  | US | 2004 | 4 |
| Class A-3 | DVI Receivables XVI, L.L.C. Series 2001-2              | 11/8/01  | Equipment Leases     | ABS | Aaa  | US | 2004 | 7 |
| Class B   | DVI Receivables XVI, L.L.C. Series 2001-2              | 11/8/01  | Equipment Leases     | ABS | Aa3  | US | 2004 | 4 |
| Class C   | DVI Receivables XVI, L.L.C. Series 2001-2              | 11/8/01  | Equipment Leases     | ABS | A2   | US | 2004 | 4 |
| Class D   | DVI Receivables XVI, L.L.C. Series 2001-2              | 11/8/01  | Equipment Leases     | ABS | Baa2 | US | 2004 | 4 |
| Class B   | DVI Receivables XVII, L.L.C. Series 2002-1             | 5/9/02   | Equipment Leases     | ABS | Aa3  | US | 2004 | 4 |
| Class C   | DVI Receivables XVII, L.L.C. Series 2002-1             | 5/9/02   | Equipment Leases     | ABS | A2   | US | 2004 | 4 |
| Class D   | DVI Receivables XVII, L.L.C. Series 2002-1             | 5/9/02   | Equipment Leases     | ABS | Baa2 | US | 2004 | 4 |
| Class E   | DVI Receivables XVII, L.L.C. Series 2002-1             | 5/9/02   | Equipment Leases     | ABS | Ba2  | US | 2004 | 4 |
| Class D   | DVI Receivables XVIII, L.L.C. Series 2002-2            | 11/14/02 | Equipment Leases     | ABS | Baa2 | US | 2004 | 4 |
| Class E   | DVI Receivables XVIII, L.L.C. Series 2002-2            | 11/14/02 | Equipment Leases     | ABS | Ba2  | US | 2004 | 4 |
| B-2       | Access Financial MH Contract Trust 1995-1              | 11/28/95 | Manufactured Housing | ABS | Ba2  | US | 2004 | 9 |
| B-2       | Access Financial MH Contract Trust 1996-1              | 5/29/96  | Manufactured Housing | ABS | Ba2  | US | 2004 | 9 |
| B-1       | Bombardier Capital Mortgage Securitization Corp 1998-A | 1/23/98  | Manufactured Housing | ABS | Baa2 | US | 2004 | 7 |
| B-2       | Bombardier Capital Mortgage Securitization Corp 1998-A | 1/23/98  | Manufactured Housing | ABS | Ba2  | US | 2004 | 2 |
| M-1       | Bombardier Capital Mortgage Securitization Corp 1998-B | 7/21/98  | Manufactured Housing | ABS | Aa3  | US | 2004 | 7 |
| M-2       | Bombardier Capital Mortgage Securitization Corp 1998-B | 7/21/98  | Manufactured Housing | ABS | A2   | US | 2004 | 7 |
| M-1       | Bombardier Capital Mortgage Securitization Corp 1999-A | 2/2/99   | Manufactured Housing | ABS | Aa3  | US | 2004 | 7 |
| M-2       | Bombardier Capital Mortgage Securitization Corp 1999-A | 2/2/99   | Manufactured Housing | ABS | A2   | US | 2004 | 7 |
| B-1       | Bombardier Capital Mortgage Securitization Corp 1999-A | 2/2/99   | Manufactured Housing | ABS | Baa2 | US | 2004 | 7 |
| M-1       | Bombardier Capital Mortgage Securitization Corp 1999-B | 9/3/99   | Manufactured Housing | ABS | Aa3  | US | 2004 | 4 |
| A-6       | Bombardier Capital Mortgage Securitization Corp 1999-B | 9/3/99   | Manufactured Housing | ABS | Aaa  | US | 2004 | 7 |
| Cl. M-1   | Bombardier Capital Mortgage Securitization Corp 2000-A | 1/27/00  | Manufactured Housing | ABS | Aa3  | US | 2004 | 7 |
| Cl. A-2   | Bombardier Capital Mortgage Securitization Corp 2000-A | 1/27/00  | Manufactured Housing | ABS | Aaa  | US | 2004 | 7 |
| Cl. M-2   | Bombardier Capital Mortgage Securitization Corp 2001-A | 1/30/01  | Manufactured Housing | ABS | A2   | US | 2004 | 7 |
| Cl. B-1   | Bombardier Capital Mortgage Securitization Corp 2001-A | 1/30/01  | Manufactured Housing | ABS | Baa2 | US | 2004 | 7 |

\* Materially impaired private securities are not listed.

### A Complete List of New Materially Impaired Structured Finance Securities in 2004\*

|           |   |          |                      |     |      |    |      |    |
|-----------|---|----------|----------------------|-----|------|----|------|----|
| Class M-2 | Conseco Finance Securitization Corp. Series 2001-4        | 12/18/01 | Manufactured Housing | ABS | A2   | US | 2004 | 8  |
| Class B-1 | Conseco Finance Securitization Corp. Series 2001-4        | 12/18/01 | Manufactured Housing | ABS | Baa2 | US | 2004 | 8  |
| Cl. M-1   | Conseco Finance Securitizations Corp. Series 1999-6       | 11/30/99 | Manufactured Housing | ABS | Aa2  | US | 2004 | 8  |
| Cl. M-1   | Conseco Finance Securitizations Corp. Series 2000-1       | 2/8/00   | Manufactured Housing | ABS | Aa2  | US | 2004 | 8  |
| Cl. M-1   | Conseco Finance Securitizations Corp. Series 2000-2       | 5/30/00  | Manufactured Housing | ABS | Aa2  | US | 2004 | 8  |
| Cl. M-1   | Conseco Finance Securitizations Corp. Series 2000-3       | 6/30/00  | Manufactured Housing | ABS | Aa2  | US | 2004 | 8  |
| Cl. M-1   | Conseco Finance Securitizations Corp. Series 2000-4       | 8/11/00  | Manufactured Housing | ABS | Aa2  | US | 2004 | 8  |
| Cl. M-1   | Conseco Finance Securitizations Corp. Series 2000-5       | 10/5/00  | Manufactured Housing | ABS | Aa2  | US | 2004 | 8  |
| Cl. M-2   | Conseco Finance Securitizations Corp. Series 2000-6       | 12/28/00 | Manufactured Housing | ABS | A2   | US | 2004 | 8  |
| Cl. M-2   | Conseco Finance Securitizations Corp. Series 2001-1       | 3/29/01  | Manufactured Housing | ABS | A2   | US | 2004 | 6  |
| Cl. M-2   | Conseco Finance Securitizations Corp. Series 2001-2       | 6/27/01  | Manufactured Housing | ABS | A2   | US | 2004 | 8  |
| Class M-2 | Conseco Finance Securitizations Corp. Series 2001-3       | 9/6/01   | Manufactured Housing | ABS | A2   | US | 2004 | 8  |
| M-2       | Green Tree Financial Corporation MH 1998-08               | 12/3/98  | Manufactured Housing | ABS | A2   | US | 2004 | 12 |
| Cl. M-1B  | Greenpoint Manufactured Housing Contract Trust 1999-5     | 11/30/99 | Manufactured Housing | ABS | Aa2  | US | 2004 | 10 |
| Cl. M-2   | Greenpoint Manufactured Housing Contract Trust 1999-5     | 11/30/99 | Manufactured Housing | ABS | A2   | US | 2004 | 10 |
| Cl. M-1   | GreenPoint Manufactured Housing Contract Trust 2000-1     | 3/16/00  | Manufactured Housing | ABS | Aa2  | US | 2004 | 10 |
| Cl. M-2   | GreenPoint Manufactured Housing Contract Trust 2000-1     | 3/16/00  | Manufactured Housing | ABS | A2   | US | 2004 | 7  |
| M         | IndyMac MH Contract 1997-1                                | 7/30/97  | Manufactured Housing | ABS | Aa3  | US | 2004 | 9  |
| M         | IndyMac MH Contract 1998-1                                | 3/13/98  | Manufactured Housing | ABS | Aa3  | US | 2004 | 9  |
| Cl. B-2   | Lehman ABS Manufactured Housing Contract Trust 2002-A     | 8/15/02  | Manufactured Housing | ABS | Ba3  | US | 2004 | 8  |
| Cl. B-1   | Madison Avenue Manufactured Housing Contract Trust 2002-A | 3/28/02  | Manufactured Housing | ABS | Baa2 | US | 2004 | 10 |
| 1-M1      | MERIT Securities Corp Series 12                           | 3/26/99  | Manufactured Housing | ABS | Aa2  | US | 2004 | 5  |
| 1-M2      | MERIT Securities Corp Series 12                           | 3/26/99  | Manufactured Housing | ABS | A2   | US | 2004 | 5  |
| 1-B       | MERIT Securities Corp Series 12                           | 3/26/99  | Manufactured Housing | ABS | Baa2 | US | 2004 | 5  |
| M1        | MERIT Securities Corp Series 13                           | 9/2/99   | Manufactured Housing | ABS | Aa2  | US | 2004 | 2  |
| M2        | MERIT Securities Corp Series 13                           | 9/2/99   | Manufactured Housing | ABS | A2   | US | 2004 | 2  |
| B1        | MERIT Securities Corp Series 13                           | 9/2/99   | Manufactured Housing | ABS | Baa2 | US | 2004 | 2  |
| B-1       | Oakwood Mortgage Investors, Inc. Series 1997-D            | 11/20/97 | Manufactured Housing | ABS | Baa2 | US | 2004 | 1  |
| M-1       | Oakwood Mortgage Investors, Inc., Series 1998-C           | 8/27/98  | Manufactured Housing | ABS | Aa3  | US | 2004 | 12 |
| M-2       | Oakwood Mortgage Investors, Inc., Series 1998-C           | 8/27/98  | Manufactured Housing | ABS | A2   | US | 2004 | 3  |
| M-1       | Oakwood Mortgage Investors, Inc., Series 1998-D           | 11/5/98  | Manufactured Housing | ABS | Aa3  | US | 2004 | 3  |
| M-2       | Oakwood Mortgage Investors, Inc., Series 1998-D           | 11/5/98  | Manufactured Housing | ABS | A2   | US | 2004 | 3  |
| M-2       | Oakwood Mortgage Investors, Inc., Series 1999-A           | 1/21/99  | Manufactured Housing | ABS | A2   | US | 2004 | 3  |
| M-1       | Oakwood Mortgage Investors, Inc., Series 1999-B           | 5/13/99  | Manufactured Housing | ABS | Aa3  | US | 2004 | 3  |
| M-2       | Oakwood Mortgage Investors, Inc., Series 1999-B           | 5/13/99  | Manufactured Housing | ABS | A2   | US | 2004 | 3  |
| M-1       | Oakwood Mortgage Investors, Inc., Series 1999-D           | 9/9/99   | Manufactured Housing | ABS | Aa3  | US | 2004 | 3  |

\* Materially impaired private securities are not listed.



## A Complete List of New Materially Impaired Structured Finance Securities in 2004\*

|           |   |          |                      |     |      |        |      |    |
|-----------|---|----------|----------------------|-----|------|--------|------|----|
| M-2       | Oakwood Mortgage Investors, Inc., Series 1999-D   | 9/9/99   | Manufactured Housing | ABS | A2   | US     | 2004 | 3  |
| Cl. M-1   | OMI Trust 2000-C  | 9/28/00  | Manufactured Housing | ABS | Aa3  | US     | 2004 | 3  |
| Cl. M-2   | OMI Trust 2000-C  | 9/28/00  | Manufactured Housing | ABS | A3   | US     | 2004 | 3  |
| Cl. M-1   | OMI Trust 2000-D  | 12/21/00 | Manufactured Housing | ABS | Aa2  | US     | 2004 | 3  |
| Cl. M-1   | OMI Trust 2001-B  | 3/15/01  | Manufactured Housing | ABS | Aa3  | US     | 2004 | 3  |
| Cl. M-1   | OMI Trust 2002-A  | 2/28/02  | Manufactured Housing | ABS | Aa3  | US     | 2004 | 3  |
| Cl. M-2   | OMI Trust 2002-A  | 2/28/02  | Manufactured Housing | ABS | A3   | US     | 2004 | 3  |
| Cl. B-1   | OMI Trust 2002-A  | 2/28/02  | Manufactured Housing | ABS | Baa2 | US     | 2004 | 3  |
| Cl. B-2   | OMI Trust 2002-A  | 2/28/02  | Manufactured Housing | ABS | Ba3  | US     | 2004 | 1  |
| Cl. B-1   | OMI Trust 2002-B  | 5/31/02  | Manufactured Housing | ABS | Baa2 | US     | 2004 | 3  |
| Cl. B-2   | OMI Trust 2002-B  | 5/31/02  | Manufactured Housing | ABS | Ba3  | US     | 2004 | 3  |
| Cl. M-1   | OMI Trust 2002-B  | 5/31/02  | Manufactured Housing | ABS | Aa3  | US     | 2004 | 3  |
| Cl. M-2   | OMI Trust 2002-B  | 5/31/02  | Manufactured Housing | ABS | A3   | US     | 2004 | 3  |
| Cl. M-1   | OMI Trust 2002-C  | 8/30/02  | Manufactured Housing | ABS | Aa3  | US     | 2004 | 3  |
| Cl. M-2   | OMI Trust 2002-C  | 8/30/02  | Manufactured Housing | ABS | A3   | US     | 2004 | 3  |
| Cl. B-1   | OMI Trust 2002-C  | 8/30/02  | Manufactured Housing | ABS | Baa2 | US     | 2004 | 3  |
| Cl. B-2   | OMI Trust 2002-C  | 8/30/02  | Manufactured Housing | ABS | Ba3  | US     | 2004 | 3  |
| Cl. A-1   | OMI Trust Series 2001-C   | 5/30/01  | Manufactured Housing | ABS | Aaa  | US     | 2004 | 4  |
| Cl. M-1   | OMI Trust Series 2001-C   | 5/30/01  | Manufactured Housing | ABS | Aa2  | US     | 2004 | 3  |
| Cl. M-1   | OMI Trust Series 2001-D   | 8/30/01  | Manufactured Housing | ABS | Aa3  | US     | 2004 | 3  |
| Cl. M-2   | OMI Trust Series 2001-D   | 8/30/01  | Manufactured Housing | ABS | A3   | US     | 2004 | 3  |
| Cl. M-1   | OMI Trust Series 2001-E   | 12/7/01  | Manufactured Housing | ABS | Aa3  | US     | 2004 | 3  |
| Cl. M-2   | OMI Trust Series 2001-E   | 12/7/01  | Manufactured Housing | ABS | A3   | US     | 2004 | 3  |
| M-1       | UCFC Funding Corporation 1998-2   | 6/17/98  | Manufactured Housing | ABS | Aa3  | US     | 2004 | 9  |
| Cl. C2    | Fixed-Link Finance B.V.   | 12/21/00 | ABS - Other          | ABS | Ba3  | Europe | 2004 | 4  |
| Class B   | FIB Business Loan Trust 2000-A  | 6/28/00  | Small Business Loans | ABS | Ba2  | US     | 2004 | 3  |
| Cl. B Ctf | Bear Stearns Home Loan Owner Trust 2001-A   | 3/9/01   | HEL                  | ABS | Ba1  | US     | 2004 | 2  |
| Cl. B-2   | Conseco Finance Home Loan Trust 1999-G  | 11/16/99 | HEL                  | ABS | Ba1  | US     | 2004 | 12 |
| Cl. B     | RAMP Series 2001-RZ2 Trust  | 5/30/01  | HEL                  | ABS | Ba2  | US     | 2004 | 5  |
| Cl. BF    | Asset Backed Securities Corporation, Long Beach Home Equity Loan Trust 2000-LB1, Home ...s 2000-LB1 | 8/31/00  | HEL                  | ABS | Baa3 | US     | 2004 | 9  |
| Cl. B-2   | Conseco Finance Home Equity and Home Improvement Loan Trust 2001-B                                  | 5/3/01   | HEL                  | ABS | Ba2  | US     | 2004 | 7  |
| Cl. I-B-2 | Conseco Finance Home Equity Loan Trust 2001-A   | 1/31/01  | HEL                  | ABS | Ba1  | US     | 2004 | 8  |
| B         | ContiMortgage Home Equity Loan Trust 1999-2   | 3/26/99  | HEL                  | ABS | Baa3 | US     | 2004 | 4  |
| B         | IMC Home Equity Loan Trust 1998-1   | 3/11/98  | HEL                  | ABS | Baa3 | US     | 2004 | 3  |
| Cl. MF-2  | IndyMac Home Equity Mortgage Loan Asset-Backed Trust, Series SPMD 2000-C                            | 11/21/00 | HEL                  | ABS | A2   | US     | 2004 | 12 |
| MF-2      | IndyMac Home Equity Mortgage Loan Asset-Backed Trust, SPMD 2001-A                                   | 2/28/01  | HEL                  | ABS | A2   | US     | 2004 | 3  |
| Cl. BF-1  | Saxon Asset Securities Trust 2001-1   | 3/29/01  | HEL                  | ABS | Baa2 | US     | 2004 | 8  |

\* Materially impaired private securities are not listed.

| <b>A Complete List of New Materially Impaired Structured Finance Securities in 2004*</b> |  |          |           |     |      |        |      |    |  |
|--|--|----------|-----------|-----|------|--------|------|----|--|
| 1-B-5  | Bear Stearns Structured Sec Inc 1997-02                    | 11/6/97  | HEL       | ABS | B2   | US     | 2004 | 7  |  |
| B-2  | Ocwen Residential MBS Corp. Mortgage Pass-Through, 1998-R3 | 9/17/98  | HEL       | ABS | A2   | US     | 2004 | 12 |  |
| B5-F   | Ocwen Residential MBS Corporation Series 1998-R2           | 6/29/98  | HEL       | ABS | B2   | US     | 2004 | 3  |  |
| B5-A   | Ocwen Residential MBS Corporation Series 1999-R1           | 3/31/99  | HEL       | ABS | B2   | US     | 2004 | 4  |  |
| Cl. B-I  | RAMP Series 2001-RS2 Trust                                 | 6/27/01  | HEL       | ABS | Ba2  | US     | 2004 | 4  |  |
| Cl. B-II   | RAMP Series 2001-RS2 Trust                                 | 6/27/01  | HEL       | ABS | Ba2  | US     | 2004 | 6  |  |
| \$100,000,000 Class D Notes  | BAC Synthetic CLO 2000-1 Limited                           | 10/5/00  | BalSh Syn | CDO | Ba3  | US     | 2004 | 10 |  |
| Class C  | BISTRO 2000-6  | 6/29/00  | BalSh Syn | CDO | Baa2 | US     | 2004 | 5  |  |
| Class IV Secured Floating Rate Notes   | EPOCH 2001-1, Limited                                      | 8/15/01  | BalSh Syn | CDO | Baa2 | US     | 2004 | 1  |  |
| \$152,000,000 Senior Secured FRN due 2008  | Aeltus CBO Limited   | 12/12/96 | HY CBO    | CDO | Aa2  | US     | 2004 | 3  |  |
| Class A-2 Second Senior Secured Notes  | CSAM High Yield Focus CBO, Ltd.                            | 6/30/99  | HY CBO    | CDO | Aa2  | US     | 2004 | 8  |  |
| \$65,000,000 Class B FRN, Due 2010   | FC CBO II Limited  | 9/9/98   | HY CBO    | CDO | Baa2 | US     | 2004 | 9  |  |
| Class III-B Mezzanine Secured Fixed Rate Notes, Due December 2012                        | Loomis Sayles FIM CBO 1, Limited                           | 1/11/01  | HY CBO    | CDO | Baa2 | US     | 2004 | 6  |  |
| US\$202,000,000 Class A Floating Rate Senior Notes                                       | Magnus Funding Ltd   | 6/18/98  | HY CBO    | CDO | Aa2  | US     | 2004 | 7  |  |
| Class A Floating Rate Senior Secured Notes due 2008                                      | ML CBO Series 1997-C-3                                     | 3/14/97  | HY CBO    | CDO | Aa2  | US     | 2004 | 10 |  |
| Class B-2 Fixed Rate Senior Secured Notes  | ML CBO Series 1998 - Deltec - 1                            | 8/27/98  | HY CBO    | CDO | Baa3 | US     | 2004 | 1  |  |
| Class A Floating Rate Senior Secured Notes due 2006                                      | ML CBO VI Series 1996-C-2                                  | 10/31/96 | HY CBO    | CDO | Aa2  | US     | 2004 | 10 |  |
| US \$55,700,000 Class A-3 Senior Secured 5.065% HYPPO Notes, Due 2011                    | PPM America High Yield CBO I                               | 3/2/99   | HY CBO    | CDO | A3   | US     | 2004 | 11 |  |
| US \$14,000,000 Class B-1 Fixed Rate Third Senior Secured Notes due 2009                 | ML CLO Series 1998-Pilgrim America-2                       | 4/28/98  | HY CLO    | CDO | Baa3 | US     | 2004 | 3  |  |
| U.S. \$12,250,000 Class A-2 Floating Rate Senior Subordinated Notes due January 15, 2013 | Valeo Investment Grade CDO                                 | 1/18/01  | IG CBO    | CDO | A3   | US     | 2004 | 1  |  |
| \$25,000,000 Class C Fixed Rate Second Senior Subordinated Secured Notes Due 2006        | J.H. Whitney Market Value Fund, L.P.                       | 3/31/99  | MV        | CDO | Ba2  | US     | 2004 | 5  |  |
| Class B Floating Rate Notes  | Amadeus Funding 1 Limited                                  | 12/23/98 | Resec     | CDO | B2   | Europe | 2004 | 4  |  |
| Class B Second Priority Senior Secured Floating Rate Notes Due 2035                      | Bleecker Structured Asset Funding, Ltd.                    | 3/28/00  | Resec     | CDO | Aa2  | US     | 2004 | 7  |  |
| Class B-1L Floating Rate Notes Due July 2036   | Diversified Asset Securitization Holdings III, L.P.        | 6/28/01  | Resec     | CDO | Baa2 | US     | 2004 | 10 |  |
| Class C-2 Mezzanine Secured Fixed Rate Notes   | E*TRADE ABS CDO I, LTD.                                    | 9/26/02  | Resec     | CDO | Baa1 | US     | 2004 | 10 |  |
| Composite Shares   | E*TRADE ABS CDO I, LTD.                                    | 9/26/02  | Resec     | CDO | Baa3 | US     | 2004 | 10 |  |
| \$12,000,000 Class C-2 Third Priority Fixed Rate Term Notes, Due 2034                    | Galleria CBO IV (formerly Beacon Hill II)                  | 7/19/01  | Resec     | CDO | Baa2 | US     | 2004 | 9  |  |

\* Materially impaired private securities are not listed.

## A Complete List of New Materially Impaired Structured Finance Securities in 2004\*

|  |   |          |               |      |      |        |      |    |
|--|---|----------|---------------|------|------|--------|------|----|
| \$26,250,000 Class C Third Priority Secured Floating Rate Notes due 2036             | Harbourview CDO III, Limited  | 4/24/01  | Resec         | CDO  | Baa2 | US     | 2004 | 3  |
| Class C Mezzanine Secured Floating Rate Notes  | Independence CDO II, Ltd.   | 7/26/01  | Resec         | CDO  | Baa2 | US     | 2004 | 8  |
| Preference Shares  | Independence CDO II, Ltd.   | 7/26/01  | Resec         | CDO  | Ba3  | US     | 2004 | 12 |
| Class C Mezzanine Secured Floating Rate Notes  | Independence I CDO, Ltd.  | 12/18/00 | Resec         | CDO  | Baa2 | US     | 2004 | 6  |
| Class B-1L Floating Rate Notes Due November 2036                                     | Mid Ocean CBO 2001-1 Ltd.   | 10/25/01 | Resec         | CDO  | Baa3 | US     | 2004 | 8  |
| 16,000 1% Cumulative Preferred Shares  | NYLIM STRATFORD CDO 2001-1 LTD.   | 4/11/01  | Resec         | CDO  | Ba3  | US     | 2004 | 12 |
| Class B-V Floating Rate Notes due June 2037  | Oceanview CBO I, Ltd.   | 6/27/02  | Resec         | CDO  | Baa2 | US     | 2004 | 12 |
| Class C Fixed Rate Notes due 2037  | Oceanview CBO I, Ltd.   | 6/27/02  | Resec         | CDO  | Ba2  | US     | 2004 | 12 |
| Class C-2  | Pacific Coast CDO Ltd.  | 9/25/01  | Resec         | CDO  | Baa2 | US     | 2004 | 4  |
| Preferred Shares   | Pacific Coast CDO Ltd.  | 9/25/01  | Resec         | CDO  | Ba2  | US     | 2004 | 6  |
| Class B1 Asset Backed Floating Rate Notes due 2040                                   | SABRE FUNDING no.1 LIMITED  | 12/22/99 | Resec         | CDO  | Baa3 | Europe | 2004 | 6  |
| Class B2 Asset Backed Floating Rate Notes due 2040                                   | SABRE FUNDING no.1 LIMITED  | 12/22/99 | Resec         | CDO  | Ba2  | Europe | 2004 | 6  |
| Class C Fixed Rate Senior Secured Notes, Due 2036                                    | Saybrook Point CBO, Limited   | 2/6/01   | Resec         | CDO  | Baa2 | US     | 2004 | 11 |
| U.S.\$12,500,000 Class C Mezzanine Floating Rate Notes Due 2036                      | Solstice ABS CBO, Ltd./Solstice ABS CBO Inc.  | 4/19/01  | Resec         | CDO  | Baa2 | US     | 2004 | 5  |
| Preference Shares  | Solstice ABS CBO, Ltd./Solstice ABS CBO Inc.  | 4/19/01  | Resec         | CDO  | Ba3  | US     | 2004 | 11 |
| Class C Notes  | Sunrise CDO I, Ltd.   | 12/19/01 | Resec         | CDO  | Baa2 | US     | 2004 | 1  |
| Class C Floating Rate Notes due 2035   | Talon Funding I, Ltd.   | 4/27/00  | Resec         | CDO  | Baa2 | US     | 2004 | 3  |
| US \$35,000,000 Class C Fixed Rate Senior Secured Notes, due November 2035           | TIAA Structured Finance CDO I, Ltd.   | 12/14/00 | Resec         | CDO  | Baa2 | US     | 2004 | 5  |
| U.S. \$50,000,000 Class B-2 Second Priority Senior Secured Fixed Rate Notes due 2035 | Varick Structured Asset Fund, Ltd.  | 9/29/00  | Resec         | CDO  | A3   | US     | 2004 | 2  |
| U.S. \$8,000,000 Class C Senior Subordinated Secured Floating Rate Notes due 2035    | Varick Structured Asset Fund, Ltd.  | 9/29/00  | Resec         | CDO  | Baa2 | US     | 2004 | 2  |
| Cl. O  | Banc of America Commercial Mortgage Inc. Commercial Mortgage Pass-Through Certificates, Series 2001-1 | 6/5/01   | Conduit       | CMBS | B3   | US     | 2004 | 9  |
| J  | Bear Stearns Commercial Mortgage Securities Inc 1998-C1   | 6/29/98  | Conduit       | CMBS | B3   | US     | 2004 | 10 |
| J  | Bear Stearns Commercial Mortgage Securities Inc 1999-C1   | 2/10/99  | Conduit       | CMBS | B3   | US     | 2004 | 3  |
| I  | CS First Boston Mortgage Securities Corp 1997-C2  | 12/19/97 | Conduit       | CMBS | B3   | US     | 2004 | 4  |
| Cl. J  | CS First Boston Mortgage Securities Corp 2000-FL1   | 12/7/00  | Floating Rate | CMBS | B3   | US     | 2004 | 6  |
| Cl. N  | CS First Boston Mortgage Securities Corp 2001-CF2   | 4/27/01  | Conduit       | CMBS | B3   | US     | 2004 | 10 |
| Cl. H  | CS First Boston Mortgage Securities Corp 2001-FL2   | 9/4/01   | Floating Rate | CMBS | Ba1  | US     | 2004 | 10 |

\* Materially impaired private securities are not listed.

## A Complete List of New Materially Impaired Structured Finance Securities in 2004\*

|          |   |          |               |      |      |    |      |    |
|----------|---|----------|---------------|------|------|----|------|----|
| Cl. J    | CS First Boston Mortgage Securities Corp 2001-FL2   | 9/4/01   | Floating Rate | CMBS | Ba2  | US | 2004 | 10 |
| Cl. K    | CS First Boston Mortgage Securities Corp 2001-FL2   | 9/4/01   | Floating Rate | CMBS | Ba3  | US | 2004 | 10 |
| Cl. L    | CS First Boston Mortgage Securities Corp 2001-FL2   | 9/4/01   | Floating Rate | CMBS | B1   | US | 2004 | 6  |
| Cl. M    | CS First Boston Mortgage Securities Corp 2001-FL2   | 9/4/01   | Floating Rate | CMBS | B2   | US | 2004 | 6  |
| C        | DLJ Commercial Mortgage Corp. 1999-CG3  | 10/12/99 | Conduit       | CMBS | Caa2 | US | 2004 | 12 |
| B-4      | DLJ Mtg Acpt Corp 1996-CF1  | 5/17/96  | Conduit       | CMBS | B2   | US | 2004 | 12 |
| K        | First Union-Lehman Brothers-Bank of America 1998-C2   | 5/28/98  | Conduit       | CMBS | B2   | US | 2004 | 9  |
| L        | First Union-Lehman Brothers-Bank of America 1998-C2   | 5/28/98  | Conduit       | CMBS | B3   | US | 2004 | 8  |
| Cl. J    | GFCM LLC, Mortgage Pass-Through Certificates, Series 2003-1   | 9/26/03  | Conduit       | CMBS | B3   | US | 2004 | 6  |
| Cl. F    | GMAC Commercial Mortgage Pass-Through Certificates, Series 2002-FL1   | 3/19/02  | Floating Rate | CMBS | Ba2  | US | 2004 | 12 |
| K        | GMAC Commercial Mortgage Securities Inc 1999-C3   | 9/13/99  | Conduit       | CMBS | B2   | US | 2004 | 12 |
| L        | GMAC Commercial Mortgage Securities Inc 1999-C3   | 9/13/99  | Conduit       | CMBS | B3   | US | 2004 | 2  |
| K        | GMAC Commercial Mortgage Securities, Inc. 1999-C2   | 6/9/99   | Conduit       | CMBS | B2   | US | 2004 | 7  |
| Cl. F    | GMAC Commercial Mortgage Securities, Inc. 2001-FL1  | 3/9/01   | Floating Rate | CMBS | Ba2  | US | 2004 | 3  |
| J        | J. P. Morgan Commercial Mortgage Finance Corp. 2000-C9  | 1/25/00  | Conduit       | CMBS | B2   | US | 2004 | 12 |
| J        | J.P. Morgan Commercial Mortgage Finance Corp 1999-C8  | 8/17/99  | Conduit       | CMBS | B2   | US | 2004 | 3  |
| K        | LB Commercial Mortgage Trust 1999-C1  | 6/10/99  | Conduit       | CMBS | B3   | US | 2004 | 2  |
| L        | LB Commercial Mortgage Trust 1999-C1  | 6/10/99  | Conduit       | CMBS | Caa2 | US | 2004 | 2  |
| Cl. M    | LB-UBS Commercial Mortgage Trust 2000-C5  | 12/6/00  | Conduit       | CMBS | B2   | US | 2004 | 5  |
| Cl. P    | LB-UBS Commercial Mortgage Trust 2000-C5  | 12/6/00  | Conduit       | CMBS | Caa2 | US | 2004 | 2  |
| G        | Mortgage Capital Funding Inc 1996-MC2   | 12/19/96 | Conduit       | CMBS | B2   | US | 2004 | 9  |
| F        | Paine Webber Mortgage Acceptance Corporation V 1999-C1  | 6/7/99   | Conduit       | CMBS | Ba2  | US | 2004 | 12 |
| G        | Paine Webber Mortgage Acceptance Corporation V 1999-C1  | 6/7/99   | Conduit       | CMBS | B2   | US | 2004 | 3  |
| Cl. L    | PNC Mortgage Acceptance Corp. Commercial Mortgage Pass-Through Certificates, Series 2000-C1   | 6/29/00  | Conduit       | CMBS | B2   | US | 2004 | 9  |
| Cl. M    | PNC Mortgage Acceptance Corp. Commercial Mortgage Pass-Through Certificates, Series 2000-C1   | 6/29/00  | Conduit       | CMBS | B3   | US | 2004 | 9  |
| Cl. N    | Prudential Securities Secured Financing Corporation, Series KEY 2000-C1   | 6/29/00  | Conduit       | CMBS | B3   | US | 2004 | 11 |
| Cl. N    | Salomon Brothers Mortgage Securities VII, Inc. 2000-C1  | 6/1/00   | Conduit       | CMBS | B3   | US | 2004 | 3  |
| Cl. J    | Salomon Brothers Mortgage Securities VII, Inc. 2000-C2  | 8/24/00  | Conduit       | CMBS | Ba2  | US | 2004 | 10 |
| Cl. K    | Salomon Brothers Mortgage Securities VII, Inc. 2000-C2  | 8/24/00  | Conduit       | CMBS | Ba3  | US | 2004 | 10 |
| Cl. L    | Salomon Brothers Mortgage Securities VII, Inc. 2000-C2  | 8/24/00  | Conduit       | CMBS | B1   | US | 2004 | 8  |
| Cl. M    | Salomon Brothers Mortgage Securities VII, Inc. 2000-C2  | 8/24/00  | Conduit       | CMBS | B2   | US | 2004 | 8  |
| Cl. G-GF | Salomon Brothers Mortgage Securities VII, Inc., CDC Securitization Corporation Commercial Mortgage Pass-Through Certificates, Series 2001-CDC | 5/30/01  | Floating Rate | CMBS | B1   | US | 2004 | 6  |

\* Materially impaired private securities are not listed.

### A Complete List of New Materially Impaired Structured Finance Securities in 2004\*

|            |  |          |                   |      |      |        |      |    |
|------------|--|----------|-------------------|------|------|--------|------|----|
| G          | Commercial Mortgage Acceptance Corp 1997-ML1                   | 12/30/97 | Large Loans       | CMBS | B2   | US     | 2004 | 4  |
| Cl. L      | GMAC Commercial Mortgage Securities, Inc. 2000-C1              | 3/16/00  | Conduit           | CMBS | B2   | US     | 2004 | 11 |
| Cl. M      | GMAC Commercial Mortgage Securities, Inc. 2000-C1              | 3/16/00  | Conduit           | CMBS | B3   | US     | 2004 | 11 |
| Cl. I-M-2  | CSFB Mortgage-Backed Pass-Through Certificates, Series 2002-18 | 5/31/02  | Alt-A Mortgage    | RMBS | A2   | US     | 2004 | 8  |
| Cl. II-M-2 | CSFB Mortgage-Backed Pass-Through Certificates, Series 2002-19 | 6/28/02  | Alt-A Mortgage    | RMBS | A2   | US     | 2004 | 9  |
| Cl. I-M-3  | CSFB Mortgage-Backed Pass-Through Certificates, Series 2002-22 | 7/31/02  | Alt-A Mortgage    | RMBS | A3   | US     | 2004 | 12 |
| C          | EuropeLoan Finance N.V.  | 5/20/02  | MBS - Other       | RMBS | Baa2 | Europe | 2004 | 5  |
| B-2        | C-BASS ABS, LLC Trust Certificates, Series 1998-2              | 6/26/98  | Resecuritized MBS | RMBS | Ba2  | US     | 2004 | 4  |
| Cl. B-2    | Conseco Finance Trust HE/HL 2001-B-2 Class B-2 Certificates    | 5/31/01  | Resecuritized MBS | RMBS | Baa2 | US     | 2004 | 7  |
| I B        | DLJ Mtg Acpt Corp 1995-T10                                     | 11/30/95 | Resecuritized MBS | RMBS | Baa2 | US     | 2004 | 5  |
| C          | Structured Mortgage Trust 1997-1                               | 3/27/97  | Resecuritized MBS | RMBS | B3   | US     | 2004 | 1  |

Note: HY CBO – high yield collateralized bond obligations; Resec – resecuritizations, or CDOs of structured finance securities; BalSh Syn – balance sheet synthetic; BalSh CF – balance sheet cash flow; IG CBO – investment-grade CBOs; HY CLO – high yield collateralized loan obligations; Syn Arb – synthetic arbitrage; MV – market value CDO; In addition, the HEL category includes first-lien subprime mortgage, high LTV loan, home equity line of credit (HELOC), home improvement loan, and net interest margin (NIM) securitizations. The majority of the recently issued HELs are backed by first-lien subprime mortgages.

\* Materially impaired private securities are not listed.

## Appendix 5

| <b>A Complete List of Non-US Materially Impaired Structured Finance Securities, 1993-2004*</b> |  |              |                    |        |                 |        |                 |                  |
|--|--|--------------|--------------------|--------|-----------------|--------|-----------------|------------------|
| Tranche Name   | Deal Name  | Closing Date | Deal Type          | Sector | Original Rating | Region | Impairment Year | Impairment Month |
| Structured Export Certificates   | IMEXSA EXPORT TRUST NO.96-1                      | 5/31/1996    | ABS - Cross-Border | ABS    | Ba2             | Latin  | 2002            | 1                |
| Class AF   | BHN IV Mortgage Trust, Series 2000-1             | 3/15/2000    | ABS - Cross-Border | ABS    | A1              | Latin  | 2002            | 1                |
| Cl. AF   | BACS I Mortgage Trust (Argentina), Series 2001-1 | 2/21/2001    | ABS - Cross-Border | ABS    | A1              | Latin  | 2002            | 1                |
| Cl. C2   | Fixed-Link Finance B.V.                          | 12/21/2000   | ABS - Other        | ABS    | Ba3             | Europe | 2004            | 4                |
| Class C-2 Second Subordinated Fixed Rate   | Falcon IV CBO                                    | 8/23/2000    | HY CBO             | CDO    | Baa2            | Europe | 2003            | 6                |
| Class D Third Subordinated Fixed Rate  | Falcon IV CBO                                    | 8/23/2000    | HY CBO             | CDO    | Ba2             | Europe | 2003            | 6                |
| Class C-2 Senior Subordinated Notes  | Mayfair Euro CDO I B.V.                          | 6/29/2001    | HY CBO             | CDO    | Ba1             | Europe | 2003            | 2                |
| Class B1 Asset Backed Floating Rate Notes due 2040   | SABRE FUNDING no.1 LIMITED                       | 12/22/1999   | Resec              | CDO    | Baa3            | Europe | 2004            | 6                |
| Class B2 Asset Backed Floating Rate Notes due 2040   | SABRE FUNDING no.1 LIMITED                       | 12/22/1999   | Resec              | CDO    | Ba2             | Europe | 2004            | 6                |
| Class B Floating Rate Notes  | Amadeus Funding 1 Limited                        | 12/23/1998   | Resec              | CDO    | B2              | Europe | 2004            | 4                |
| Class C  | Cathedral, Synthetic CBO                         | 5/27/1999    | Syn Arb            | CDO    | Ba2             | Europe | 2002            | 1                |
| Class C Secured Floating Rate Notes  | Scala Synthetic II Plc                           | 12/12/2000   | Syn Arb            | CDO    | Baa3            | Europe | 2002            | 2                |
| B  | Helix Capital (Netherlands) B.V. Series 2001-1   | 4/20/2001    | Syn Arb            | CDO    | Baa2            | Europe | 2002            | 12               |
| C2 Credit Linked Notes   | Deutsche Bank Repon 2001-14                      | 4/18/2001    | Syn Arb            | CDO    | A2              | Europe | 2003            | 3                |
| Class C Secured Floating Rate Notes  | Scala Synthetic III Plc                          | 6/26/2001    | Syn Arb            | CDO    | Baa3            | Europe | 2003            | 4                |
| EUR 75,000,000 Variable Redemption Limited Recourse Notes                                      | Helix Capital (Netherlands) B.V. Series 2001-5   | 10/16/2001   | Syn Arb            | CDO    | Baa3            | Europe | 2003            | 10               |
| USD 75,000,000 Variable Redemption Limited Recourse Notes                                      | Helix Capital (Netherlands) B.V. Series 2001-6   | 10/11/2001   | Syn Arb            | CDO    | Baa2            | Europe | 2002            | 3                |
| Class I  | Spices Finance Limited - Peas 2                  | 9/19/2001    | Syn Arb            | CDO    | Ba1             | Europe | 2003            | 4                |
| EUR 75,000,000 Variable Redemption Limited Recourse Notes                                      | Helix Capital (Netherlands) B.V. Series 2001-9   | 12/11/2001   | Syn Arb            | CDO    | Baa3            | Europe | 2003            | 10               |
| C  | EuropeLoan Finance N.V.                          | 5/20/2002    | MBS - Other        | RMBS   | Baa2            | Europe | 2004            | 5                |

*Note: HY CBO – high yield collateralized bond obligations; Resec – securitizations, or CDOs of structured finance securities; BalSh Syn – balance sheet synthetic; BalSh CF – balance sheet cash flow; IG CBO – investment-grade CBOs; HY CLO – high yield collateralized loan obligations; Syn Arb – synthetic arbitrage; MV – market-value CDO; In addition, the HEL category includes first-lien subprime mortgage, high LTV loan, home equity line of credit (HELOC), home improvement loan, and net interest margin (NIM) securitizations. The majority of the recently issued HELs are backed by first-lien subprime mortgages.*

*\* Materially impaired private securities are not listed.*

To order reprints of this report (100 copies minimum), please call 1.212.553.1658.  
Report Number: 93653

| <u>Author</u>  | <u>Editor</u>         | <u>Senior Associates</u>                   | <u>Production Specialist</u> |
|----------------|-----------------------|--|------------------------------|
| <i>Jian Hu</i> | <i>Michael D'Arcy</i> | <i>Hadas Alexander<br/>Alexandra Neely</i> | <i>Ida Chan</i>              |

© Copyright 2005, Moody's Investors Service, Inc. and/or its licensors including Moody's Assurance Company, Inc. (together, "MOODY'S"). All rights reserved. **ALL INFORMATION CONTAINED HEREIN IS PROTECTED BY COPYRIGHT LAW AND NONE OF SUCH INFORMATION MAY BE COPIED OR OTHERWISE REPRODUCED, REPACKAGED, FURTHER TRANSMITTED, TRANSFERRED, DISSEMINATED, REDISTRIBUTED OR RESOLD, OR STORED FOR SUBSEQUENT USE FOR ANY SUCH PURPOSE, IN WHOLE OR IN PART, IN ANY FORM OR MANNER OR BY ANY MEANS WHATSOEVER, BY ANY PERSON WITHOUT MOODY'S PRIOR WRITTEN CONSENT.** All information contained herein is obtained by MOODY'S from sources believed by it to be accurate and reliable. Because of the possibility of human or mechanical error as well as other factors, however, such information is provided "as is" without warranty of any kind and MOODY'S, in particular, makes no representation or warranty, express or implied, as to the accuracy, timeliness, completeness, merchantability or fitness for any particular purpose of any such information. Under no circumstances shall MOODY'S have any liability to any person or entity for (a) any loss or damage in whole or in part caused by, resulting from, or relating to, any error (negligent or otherwise) or other circumstance or contingency within or outside the control of MOODY'S or any of its directors, officers, employees or agents in connection with the procurement, collection, compilation, analysis, interpretation, communication, publication or delivery of any such information, or (b) any direct, indirect, special, consequential, compensatory or incidental damages whatsoever (including without limitation, lost profits), even if MOODY'S is advised in advance of the possibility of such damages, resulting from the use of or inability to use, any such information. The credit ratings and financial reporting analysis observations, if any, constituting part of the information contained herein are, and must be construed solely as, statements of opinion and not statements of fact or recommendations to purchase, sell or hold any securities. **NO WARRANTY, EXPRESS OR IMPLIED, AS TO THE ACCURACY, TIMELINESS, COMPLETENESS, MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OF ANY SUCH RATING OR OTHER OPINION OR INFORMATION IS GIVEN OR MADE BY MOODY'S IN ANY FORM OR MANNER WHATSOEVER.** Each rating or other opinion must be weighed solely as one factor in any investment decision made by or on behalf of any user of the information contained herein, and each such user must accordingly make its own study and evaluation of each security and of each issuer and guarantor of, and each provider of credit support for, each security that it may consider purchasing, holding or selling.

MOODY'S hereby discloses that most issuers of debt securities (including corporate and municipal bonds, debentures, notes and commercial paper) and preferred stock rated by MOODY'S have, prior to assignment of any rating, agreed to pay to MOODY'S for appraisal and rating services rendered by it fees ranging from \$1,500 to \$2,400,000. Moody's Corporation (MCO) and its wholly-owned credit rating agency subsidiary, Moody's Investors Service (MIS), also maintain policies and procedures to address the independence of MIS's ratings and rating processes. Information regarding certain affiliations that may exist between directors of MCO and rated entities, and between entities who hold ratings from MIS and have also publicly reported to the SEC an ownership interest in MCO of more than 5%, is posted annually on Moody's website at [www.moody.com](http://www.moody.com) under the heading "Shareholder Relations — Corporate Governance — Director and Shareholder Affiliation Policy."

**Contact**

**Phone**

**New York**

Jian Hu  
Hadas Alexander  
Debjani Roy  
Julia Tung  
Richard Cantor  
Gus Harris  
Detlef Scholz  
Nicolas Weill

1.212.553.1653

## **Default & Loss Rates of Structured Finance Securities: 1993-2005**

### **Summary Opinion**

This Special Comment presents Moody's fourth annual report of the default, impairment, and loss rates of global structured finance securities, covering the credit performance through year-end 2005 of all structured finance securities issued since 1993. The following are the highlights of this report:

- The credit performance of structured finance securities improved sharply in 2005. The number of newly impaired tranches fell to 98 in 2005 from 213 in 2004, reflecting a large drop in the number of newly impaired US ABS and global CDO securities. Declining impairments, coupled with strong growth in the number of outstanding ratings, drove the one-year impairment rate – the number of newly impaired tranches as a percentage of the total tranches outstanding at the beginning of a year – down to historical lows. The one-year investment-grade impairment rate fell to 0.05% in 2005 from 0.4% in 2004, while the one-year speculative-grade impairment rate dropped to 2.7% from 5.4%.
- Five-year loss rates as a percent of original balances have averaged 0.017% for Aaa-rated, 0.7% for Aa-rated, 1.8% for single-A-rated, 5.8% for Baa-rated, and 11.7% for speculative-grade-rated securities. Historical average loss rates, however, have varied substantially across asset classes, with those in the CMBS and RMBS sectors being the lowest among all structured finance sectors.
- When weighted by dollar volume, the average credit loss rate across all structured finance has been very low, which should be expected since 83% (by volume) of all securities have been rated Aaa at issuance. Within five years of origination, the volume-weighted aggregate loss rate has been about 0.49%.
- By the end of 2005, 1,095 securities issued since 1993 had become materially impaired. This represents roughly 2.3% of the 47,519 structured finance tranches and 4.4% of the 13,619 transactions studied. Of the \$6.2 trillion worth of dollar-denominated structured finance tranches in the sample, 0.47% (by original balance) became impaired.
- Final loss severity rates on impaired securities have averaged 53% as a share of original balances for the 352 impaired securities that have reached "maturity" (i.e., with no remaining principal balance) as of year-end 2005. The final loss severity rates of all impaired securities including those with balances still outstanding are expected to be lower. Final loss severity rates have historically been higher on matured ABS and CDO defaults than on matured RMBS and HEL defaults, and higher on securities rated lower at issuance than those rated higher at issuance.





**Figure 1 – New Impairments in 2005 and Lifetime Impairments since 1993**

|                     | 2005                      |             |                          |             | 1993-2005             |             |                          |             |
|---------------------|---------------------------|-------------|--------------------------|-------------|-----------------------|-------------|--------------------------|-------------|
|                     | Number of New Impairments |             | One-Year Impairment Rate |             | Number of Impairments |             | Lifetime Impairment Rate |             |
|                     | Invest. Grade             | Spec. Grade | Invest. Grade            | Spec. Grade | Invest. Grade         | Spec. Grade | Invest. Grade            | Spec. Grade |
| US ABS              | 4                         | 36          | 0.04%                    | 5.6%        | 402                   | 139         | 3.2%                     | 22.9%       |
| US CMBS             | 0                         | 32          | 0.00%                    | 2.9%        | 15                    | 81          | 0.5%                     | 6.5%        |
| US RMBS             | 3                         | 8           | 0.07%                    | 1.4%        | 90                    | 60          | 1.3%                     | 6.0%        |
| Global CDOs         | 4                         | 11          | 0.10%                    | 1.7%        | 181                   | 122         | 3.7%                     | 19.8%       |
| European SF ex CDOs | 0                         | 0           | 0.00%                    | 0.0%        | 1                     | 1           | 0.0%                     | 0.7%        |
| SF in Other Regions | 0                         | 0           | 0.00%                    | 0.0%        | 2                     | 1           | 0.1%                     | 0.6%        |
| All SF              | 11                        | 87          | 0.05%                    | 2.7%        | 691                   | 404         | 2.2%                     | 10.7%       |

*Note: The categorization of investment (invest.) grade and speculative (spec.) grade for the 2005 data is based on the security's rating at the beginning of 2005. For the overall historical totals during 1993-2005, the categorization is by their original rating. Lifetime impairment rates are computed by dividing the total number of impairments from 1993 to 2005 by all the securities issued from 1993 to 2004 (securities issued in 2005 are not included.) SF stands for "structured finance," which includes ABS (including HELs), CMBS, RMBS, and CDOs. See Appendix 1 for a description of the data sample and glossary.*

---

---

# Table of Contents

---

|  | Page      |
|--|-----------|
| <b>Summary Opinion .....</b>   | <b>1</b>  |
| <b>Overview of Global Structured Finance Material Impairments in 2005 .....</b>            | <b>4</b>  |
| <b>Analysis of Material Impairments and Payment Defaults by Credit Event .....</b>         | <b>6</b>  |
| Distribution of Material Impairments by Credit Event .....                                 | 6         |
| Analyzing the Cure Rate of Payment Defaults .....  | 6         |
| Comparing Reasons Underlying Uncured Payment Defaults by Sector .....                      | 8         |
| <b>Analysis of Material Impairments by Sector, Rating, and Vintage .....</b>               | <b>8</b>  |
| US ABS: Impairment Rates Dropped Precipitously .....                                       | 8         |
| US HEL: Impairment Rates Edged Down .....  | 10        |
| US CMBS: Impairment Rates Remained Low .....   | 11        |
| US RMBS: Impairment Rates Rose in the Speculative-Grade Category .....                     | 13        |
| Global CDOs: Impairment Rates Plunged Across All Categories .....                          | 14        |
| <b>Loss Severity Rates on Impaired Tranches by Sector, Rating, and Horizon .....</b>       | <b>17</b> |
| Final LGD of Matured Defaults in All Structured Finance Averaged 53% .....                 | 17        |
| Estimated Final LGD Rates on Impaired RMBS and HEL Tranches Averaged 32% .....             | 19        |
| Estimated Final LGD Rates on Impaired CDO Tranches Averaged 72% .....                      | 20        |
| Comparing LGD Rates by Time Horizon .....  | 21        |
| <b>Multi-Year Cumulative Loss Rates by Rating and Sector .....</b>                         | <b>22</b> |
| <b>Appendix 1: Descriptions of Data Sample and Glossary .....</b>                          | <b>24</b> |
| Description of Data Sample .....   | 24        |
| Glossary .....   | 24        |
| <b>Appendix 2: How to Calculate Multi-Year Material Impairment Rate and LGD Rate .....</b> | <b>27</b> |
| Cumulative Impairment Rate by Cohort Rating .....  | 27        |
| Cumulative Impairment Rate by Original Rating .....  | 28        |
| Multi-Year Cumulative LGD Rates .....  | 29        |
| <b>Appendix 3: Impairment Rates by Rating .....</b>  | <b>30</b> |
| <b>Appendix 4: Estimated Loss Rates by Rating .....</b>                                    | <b>36</b> |
| <b>Appendix 5: List of 2005 New Impairments .....</b>                                      | <b>41</b> |
| <b>Related Research .....</b>  | <b>46</b> |

## Overview of Global Structured Finance Material Impairments in 2005

2005 was a year of strong growth and superb credit performance for global structured finance. The sector continued to grow at a brisk rate with traditional securitizations remaining strong and new products and new features being introduced into the market. The year 2005 also marked the first time asset-backed credit default swaps (ABS CDS) were introduced to the market, potentially enhancing the liquidity of ABS securities and showing that the market is becoming increasingly mature.

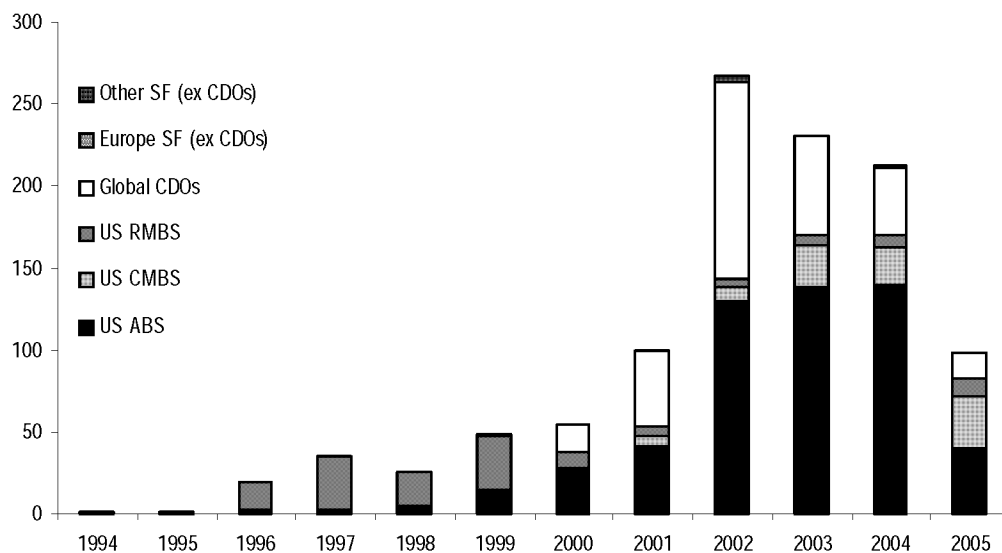
With the benign corporate environment, strong real estate markets, and low interest rates, the structured finance sector saw only 98 tranches become newly impaired in 2005. This number is substantially lower than those observed during 2002-2004 and similar to the level last seen in 2001 (see Figure 2). Moreover, roughly 50 previously impaired tranches, or about 4.8% of the total 1051 impairments as of year-end 2004, were cured in 2005, as collateral asset valuation strengthened and interest payments reverted to current.

Both the US ABS and global CDO sectors dramatically improved with only 40 and 15 new impairments in 2005, respectively, compared to 140 for US ABS and 41 for global CDOs in 2004. In particular, manufactured housing (MH) loan-backed ABS and high-yield corporate bond-backed CDOs (HYCBOs) saw the number of new impairments dwindle, with just three for MH and none for HY CBOs in 2005, down from 76 and 11 in 2004, respectively.

The CMBS, HEL, and RMBS sectors, supported by the continuing strong real estate markets and the steady and low interest rate environment, performed well and similarly in 2005 and 2004. There were 32 newly impaired tranches in CMBS, 20 in HEL, and 11 in RMBS in 2005, up slightly from 23, 16, and 7 in the prior year. Moreover, 19 of the 42 impaired CMBS tranches in 2004 were subsequently cured in 2005.

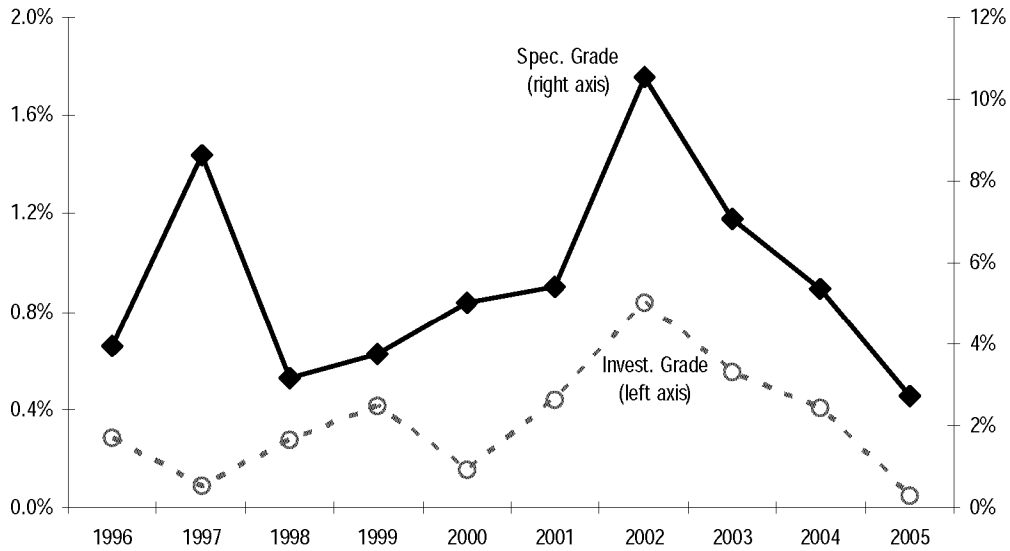
The structured finance sector outside the United States excluding CDOs did not have any newly impaired tranches in 2005. The sector's total number of impairments remains at only five for the entire sample period.

**Figure 2 – Number of New Material Impairments**



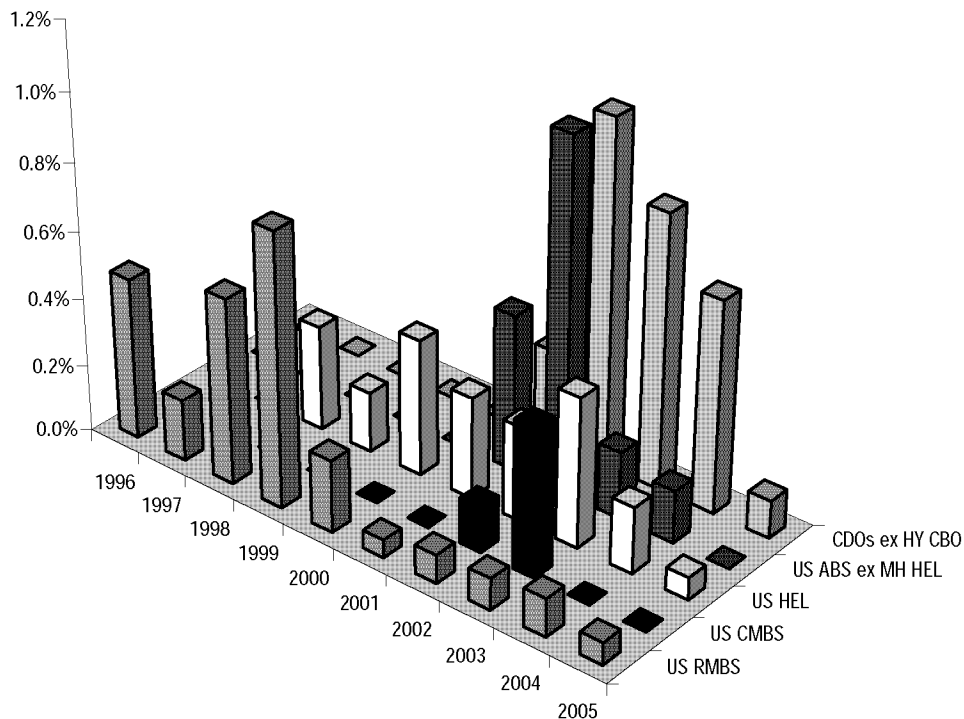
Declining impairments, coupled with strong growth in the number of outstanding ratings, drove the one-year impairment rate – the number of newly impaired tranches as a percentage of the total tranches outstanding at the beginning of a year – down to historical lows. Within the speculative-grade category, which includes securities rated Ba, single-B or Caa, the one-year impairment rate fell to 2.7% in 2005 from 5.4% in 2004, and within the investment-grade category, which includes securities rated Baa or above, the impairment rate went down to 0.05% from 0.4% (see Figure 3).

**Figure 3 – Investment-Grade and Speculative-Grade One-Year Impairment Rates in Structured Finance Overall**



The improvements in the impairment rates were broad-based, affecting all sectors. In the investment-grade portion of the market, which comprises about 99% of total issuance volume or 90% of all structured finance securities, the one-year impairment rate declined across all sectors in 2005, especially in the ABS and CDOs sectors (see Figure 4). In addition, the investment-grade impairment rate was almost zero in the ABS (excluding MH and HEL) sector for the first time since 2001, and zero for the CMBS sector for the second year in a row.

**Figure 4 – Investment-Grade One-Year Impairment Rates by Sector**



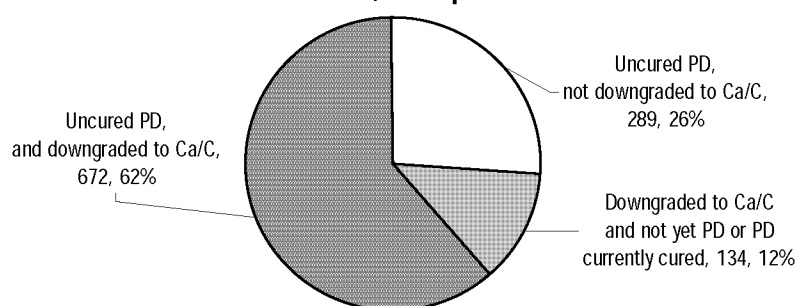
## Analysis of Material Impairments and Payment Defaults by Credit Event

### DISTRIBUTION OF MATERIAL IMPAIRMENTS BY CREDIT EVENT

During the sample period between 1993 and 2005, a total of 1,095 tranches from 599 structured finance deals became impaired. This represents roughly 2.3% of the 47,519 structured finance tranches and 4.4% of the 13,619 deals studied. Of all dollar-denominated structured finance tranches, roughly 0.47% of the \$6.2 trillion worth of tranches (by their original balance) studied became impaired.

Uncured payment defaults were the predominant reason for material impairments in the entire sample period. Figure 5 shows that 88% of all impairments were uncured payment defaults — 62% were rated Ca or C by year-end 2005, and 26% were not. The remaining 12% of all historical impairments consists of securities that were downgraded to Ca or C, but either have yet to experience a payment default, or defaulted, but then was cured by the end of 2005.

**Figure 5 – Distribution of Impairments by Credit Event, 1993-2005**  
Total 1,095 Impairments



Note: PD stands for payment default.

### ANALYZING THE CURE RATE OF PAYMENT DEFAULTS

As documented in our prior reports,<sup>1</sup> structured finance payment defaults can be cured, and in some sectors such as CMBS the cure rate can be very high (at 67% according to the data in Figure 6). The cure rates in the ABS and RMBS sectors are considerably lower than those in CMBS. As a result, most structured finance payment defaults (including payment-in-kind (PIK) CDO bonds) with the exception of those in the CMBS sector remained materially impaired. While the lifetime cure rate is 23% for the overall market, the cure rate is only 11% for sectors other than CMBS.

**Figure 6 – Distribution of Cured and Uncured Payment Defaults by Sector, 1993-2005**

|                     | All Payment Defaults | Payment Defaults Uncured | Payment Defaults Cured | Cure Percentage | Mean Duration of Cure (months) | Median Duration of Cure (months) |
|---------------------|----------------------|--------------------------|------------------------|-----------------|--------------------------------|----------------------------------|
| US ABS              | 483                  | 450                      | 33                     | 6.8%            | 5.7                            | 1.0                              |
| US CMBS             | 280                  | 95                       | 185                    | 66.1%           | 3.1                            | 1.0                              |
| US RMBS             | 159                  | 147                      | 12                     | 7.6%            | 2.5                            | 1.0                              |
| Global CDOs         | 325                  | 268                      | 57                     | 17.5%           | 22.0                           | 22.5                             |
| European SF ex CDOs | 1                    | 1                        | 0                      | 0.0%            |                                |                                  |
| Total               | 1,248                | 961                      | 287                    | 23.0%           |                                |                                  |

A number of previously outstanding CDO payment defaults, however, were cured in 2005. Most of the cured defaults were HYCBO securities that had previously been "PIKing" (payment-in-kind) or deferring interest. As the credit quality of the corporate assets in some CBO collateral pools strengthened, valuations and cash flows increased, enabling cash interest payments to become current. The lifetime cure rate of CDO payment defaults doubled to 18% as of year-end 2005, up from the 9% rate stated in our last year's report.

Payment defaults, if cured, are generally cured within a short time after the initial missed payment. For instance, when CMBS payment defaults have been cured, the time from default to cure has generally been brief, with an average of three months and a median of just one month. In fact, most payment default cures in ABS, CMBS, and RMBS occur within three months of the initial default date. In 2005, the percentage of new defaults that was cured within this calendar year was 23%, which was similar to the rate of 26% in 2004. (Because these cured-within-the-year defaults

1. See for example, "Default & Loss Rates of Structured Finance Securities: 1993-2004," Moody's Special Comment, July 2005.

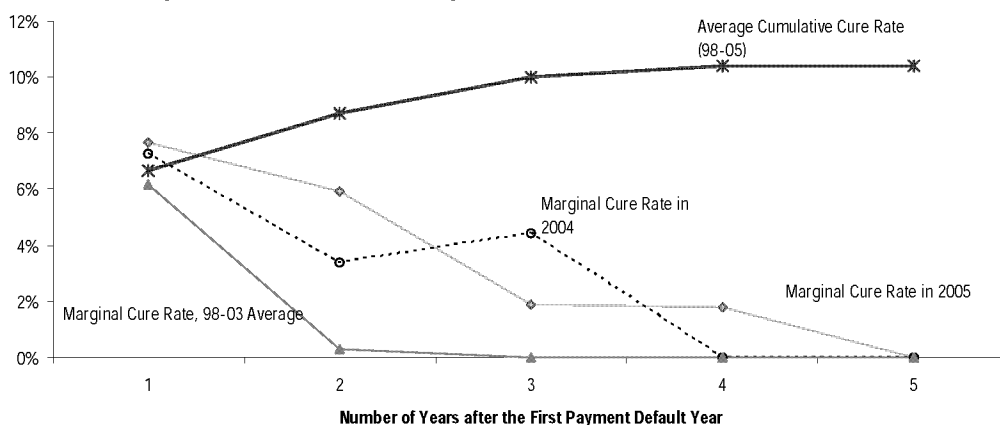
are not outstanding at year-end, they are not included in the total number of new material impairments regularly reported for each year-end.)

However, Figure 6 reveals that the cures of CDO defaults took considerably longer (averaging 22 months) than cures in other sectors, partly because CDO bonds have lower payment frequencies (quarterly or semi-annually) and partly because the valuation of corporate assets may be more volatile than the valuation of other types of collateral.

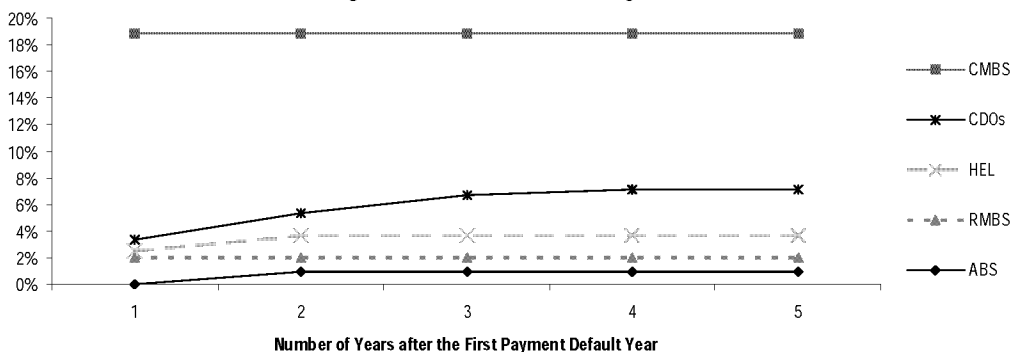
To summarize the cure rate trend over time and its potential impact on our reported historical impairment rates, Panel A of Figure 7 shows marginal cure rates in 2005, 2004, and the historical average during 1998-2003 for all structured finance as a whole. The marginal cure rate concept can be best explained using an example. In Figure 7, we show that the fourth year marginal cure rate was about 2% in Panel A. This means that of all the securities that defaulted in 2001, 2% were cured in 2005 — the fourth year after their first payment default year.

**Figure 7 – Marginal and Cumulative Cure Rates for All Structured Finance as a Whole and by Sector, 1998-2005**

**Panel A: Marginal Cure Rates and Average Cumulative Cure Rates for All Structured Finance**



**Panel B: Average Cumulative Cure Rate by Sector, 1998-2005**



Note: For a cohort of securities that experienced payment defaults in year  $t$ , the  $N$ -th year marginal cure rate measures the number of payment defaults cured in year  $(t+N)$  (measured in calendar years, not in actual number of months), as a share of all payment defaults occurred in year  $t$ .

Panel A of Figure 7 also depicts an average cumulative cure rate curve over 1998-2005 and reveals that over four or five years approximately 10% of uncured payment defaults will be cured. This implies that our historical four-year or five-year old impairment rates on average could be revised downward about 10%.

Panel B further depicts the differences in cumulative cure rates across sectors. The findings are largely similar to those reported in Figure 6, with cured rate being the highest in CMBS and the lowest in ABS.

In addition, cures were observed in 2005 on payment defaults that occurred in all four prior years, as was mostly the case in 2004. In fact, the lifetime cure rate of payment defaults, defined as the total number of cures (including intra-year cures) as a share of all payment defaults in the data sample, rose to 23% in 2005 (as shown in Figure 6) from 19% in last year's study.<sup>2</sup>

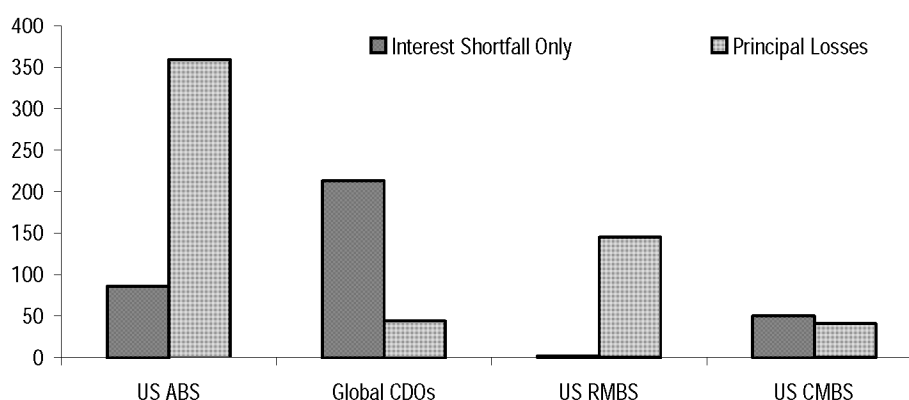
2. We note that cure rates vary by sector, and not surprisingly, by rating category as well. Higher rated payment defaults tend to be cured more frequently than lower rated ones.

## COMPARING REASONS UNDERLYING UNCURED PAYMENT DEFAULTS BY SECTOR

For payment defaults that remained uncured, the underlying reasons have varied by sector. In the CMBS sector, 41 tranches have suffered principal losses as of year-end 2005, compared with 50 tranches experiencing uncured interest shortfalls (see Figure 8). Historically, a total of 185 CMBS securities recorded some interest shortfalls, but most of them were cured.

In the CDO sector, 44 or about 17% of the 257 payment defaults had suffered principal losses. Most of the CDO defaults were PIKing or simply deferring interests. By contrast, in the ABS and RMBS sectors, defaulted securities that had experienced only interest shortfalls were a minority, making up 19% of all ABS defaults and only 1% of all RMBS defaults during the sample period. As we showed in prior-year reports, defaults with principal losses are much less likely to be cured than those experiencing only interest shortfalls.<sup>3</sup>

**Figure 8 – Number of Uncured Payment Defaults with Interest Shortfalls and Principal Losses by Sector, 1993-2005**



## Analysis of Material Impairments by Sector, Rating, and Vintage

### US ABS: IMPAIRMENT RATES DROPPED PRECIPITOUSLY

The US ABS sector, including HEL, demonstrated much-improved performance in 2005, as the number of new impairments in the troubled manufactured housing loan, franchise loan, and aircraft and equipment lease categories finally dwindled to single digits. While the number of new HEL impairments exceeded those of other ABS asset classes, its impairment rate remained very low relative to its large number of securities outstanding (see Figure 9).

**Figure 9 – 2005 US ABS New Impairments by Asset Class, Compared to Their Historical Totals**

|                | Number of New Impairments in 2005 | Securities Outstanding in 2005 | 2005 Impairment Rate | Number of Impairments, 1993-2005 | Securities Issued, 1993-2004 | Lifetime Impairment Rate |
|----------------|-----------------------------------|--------------------------------|----------------------|----------------------------------|------------------------------|--------------------------|
| Autos          | 0                                 | 391                            | 0.0%                 | 10                               | 884                          | 1.1%                     |
| Cards          | 0                                 | 852                            | 0.0%                 | 12                               | 1,634                        | 0.7%                     |
| Franchise      | 6                                 | 104                            | 5.8%                 | 60                               | 165                          | 36.4%                    |
| HEL            | 20                                | 6,381                          | 0.3%                 | 108                              | 7,640                        | 1.4%                     |
| Health Care    | 0                                 | 6                              | 0.0%                 | 26                               | 32                           | 81.3%                    |
| Leases         | 5                                 | 224                            | 2.2%                 | 55                               | 507                          | 10.8%                    |
| Manu. Housing  | 3                                 | 430                            | 0.7%                 | 261                              | 783                          | 33.3%                    |
| RVs, Trucks    | 3                                 | 57                             | 5.3%                 | 5                                | 119                          | 4.2%                     |
| Small Business | 3                                 | 141                            | 2.1%                 | 4                                | 151                          | 2.6%                     |
| Other ABS      | 0                                 | 1,024                          | 0.0%                 | 0                                | 1,388                        | 0.0%                     |
| All US ABS     | 40                                | 9,610                          | 0.4%                 | 541                              | 13,303                       | 4.1%                     |

*Note: RVs are recreational vehicles.*

3. See Moody's Special Comment, "Default & Loss Rates of Structured Finance Securities: 1993-2004," July 2005.

Only three manufactured housing and six franchise loan ABS tranches became newly impaired in 2005, which is much fewer than the number of impairments in these categories in recent years. Furthermore, 10 MH tranches that had previously experienced interest shortfalls (some for more than two years) repaid all their interest shortfalls in 2005 and became cured, mainly because the housing market remained strong and recovery values increased. These suggest that the troubles in these two severely impaired ABS categories finally ran out of steam.

In the aircraft and equipment lease categories, two tranches of an Aircraft Finance Trust transaction missed interest payments in 2005, and two tranches of a DVI VIII transaction were downgraded to Ca or C, although payment defaults were not yet observed on these two tranches. In addition, one tranche from an aircraft transaction (ALPS 96-1) experienced substantial write-downs in December 2005.

In addition, two ABS tranches backed by the retail installment sales contracts of recreational vehicles (RVs) missed interest payments in 2005 for the first time. A third tranche from a RV deal was originated by Green Tree and experienced interest shortfalls first in 2002, but was cured three months later. In 2005, however, this security has suffered substantial losses of principal.

Finally, three small business loan ABS issued in 2000 and originally sponsored by First International Bank (FIB) were downgraded into the Ca/C category in 2005. The pools underlying these transactions performed poorly as a result of the manufacturing sector's recession in 2000 and 2001.

By rating at the beginning of the year, no securities rated single-A or above suffered any new impairments in 2005 (Figure 10), while the Baa one-year impairment rate was the lowest in five years. The one-year impairment rates in the speculative-grade categories were also much lower in 2005.

**Figure 10 – US ABS One-Year Impairment Rates by Rating at the Beginning of the Year**

| Rating at the Beginning of the Year | 2001   | 2002   | 2003   | 2004   | 2005   |
|-------------------------------------|--------|--------|--------|--------|--------|
| Aaa                                 | 0.00%  | 0.40%  | 0.00%  | 0.00%  | 0.00%  |
| Aa                                  | 0.37%  | 1.45%  | 0.00%  | 1.42%  | 0.00%  |
| A                                   | 0.67%  | 0.32%  | 0.27%  | 0.69%  | 0.00%  |
| Baa                                 | 1.84%  | 2.36%  | 4.50%  | 1.52%  | 0.16%  |
| Ba                                  | 5.61%  | 25.38% | 18.36% | 12.36% | 1.71%  |
| B                                   | 18.35% | 24.76% | 38.67% | 20.69% | 7.43%  |
| Caa                                 | 0.00%  | 60.87% | 42.62% | 55.86% | 23.03% |
| Investment Grade                    | 0.55%  | 0.87%  | 0.96%  | 0.77%  | 0.04%  |
| Speculative Grade                   | 8.20%  | 26.25% | 24.18% | 19.22% | 5.64%  |
| All Ratings                         | 1.06%  | 2.51%  | 2.44%  | 1.98%  | 0.42%  |

The credit performance of US ABS securities also varied across vintages (Figure 11). Tranches issued in 1999 and 2000 performed much more poorly than those issued since 2001. For example, about 20% of the 1999 and 2000 vintage Baa tranches were impaired, but only 9% of the Baa-rated securities issued in 2001 were impaired. Tranches issued in 2002 and 2003 have so far performed very well. The higher impairment rates in the Aa category stemmed mainly from problems in the manufactured housing loan, franchise loan, and health care receivable ABS categories.

**Figure 11 – US ABS Lifetime Impairment Rates by Original Rating on Securities Issued during 1999-2003**

| Original Rating   | 1999 Vintage | 2000 Vintage | 2001 Vintage | 2002 Vintage | 2003 Vintage |
|-------------------|--------------|--------------|--------------|--------------|--------------|
| Aaa               | 1.5%         | 1.3%         | 1.8%         | 0.5%         | 0.0%         |
| Aa                | 15.6%        | 13.1%        | 5.2%         | 2.4%         | 0.3%         |
| A                 | 8.8%         | 9.1%         | 4.1%         | 1.0%         | 0.2%         |
| Baa               | 18.8%        | 19.4%        | 8.7%         | 2.0%         | 0.1%         |
| Ba                | 50.0%        | 37.8%        | 37.3%        | 13.9%        | 2.4%         |
| B                 | 70.0%        | 72.7%        | 0.0%         | 0.0%         | 0.0%         |
| Caa               | 0.0%         | n/a          | 100.0%       | n/a          | n/a          |
| Investment Grade  | 8.9%         | 9.0%         | 4.5%         | 1.4%         | 0.1%         |
| Speculative Grade | 53.7%        | 44.6%        | 36.4%        | 13.2%        | 2.1%         |
| All Ratings       | 11.3%        | 11.1%        | 6.0%         | 2.0%         | 0.2%         |

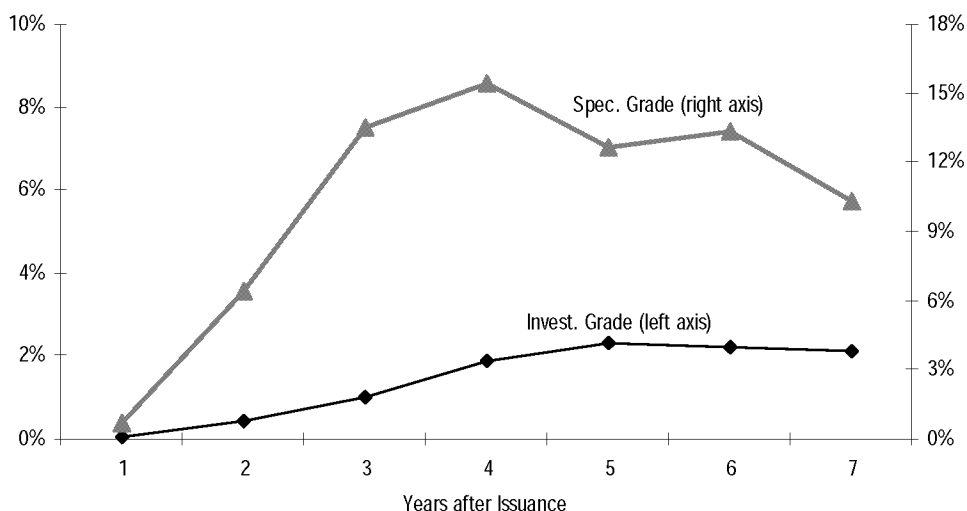
*Note: Lifetime impairment rate is the total number of impaired securities to date as a share of all securities issued. No Caa-rated securities were issued in 2000, 2001, and 2003.*



As documented in our prior reports, impairment rates tend to exhibit seasoning patterns. We found that these seasoning patterns also differed by rating. Figure 12 depicts that in the US ABS sector, the marginal impairment rates, measured by the number of new impairments as a share of all surviving (not previously impaired or withdrawn) securities at the beginning of a year, peaked in the fourth year for speculative-grade securities, and the fifth year for investment-grade securities.

The impairment rate experienced its steepest increase in the first three years after issuance. The differentials between the two marginal impairment rates curves vary from roughly 6% in the second year to about 14% in the fourth year. Moreover, the impairment rates even six years after issuance can be material, as demonstrated by the level of the curves in the fifth, sixth, and seventh year after issuance.

**Figure 12 – US ABS Marginal Impairment Rates by Years after Issuance, 1993-2005**



**US HEL: IMPAIRMENT RATES EDGED DOWN**

The HEL category has traditionally been categorized as an ABS asset class. In recent years, strong growth has made it the largest segment within the ABS sector. In this section, we examine its impairment experiences separately.

In 2005, there were 20 new impairments in this sector, compared to 16 in 2004. The one-year impairment rate dropped to a five-year low of 0.3% of all securities outstanding at the beginning of 2005 (Figure 13). The one-year impairment rates of securities rated single-A or above have remained low for five years in a row, and the Baa impairment rate was also on the decline at just 0.2% in 2005.

**Figure 13 – HEL One-Year Impairment Rates by Rating at the Beginning of the Year**

| Rating at the Beginning of the Year | 2001   | 2002   | 2003   | 2004   | 2005   |
|-------------------------------------|--------|--------|--------|--------|--------|
| Aaa                                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| Aa                                  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| A                                   | 0.41%  | 0.00%  | 0.00%  | 0.12%  | 0.00%  |
| Baa                                 | 0.85%  | 1.15%  | 1.66%  | 0.56%  | 0.20%  |
| Ba                                  | 3.92%  | 0.00%  | 10.14% | 3.56%  | 2.88%  |
| B                                   | 13.33% | 10.17% | 17.86% | 10.34% | 20.00% |
| Caa                                 | 0.00%  | 80.00% | 71.43% | 40.00% | 25.00% |
| Investment Grade                    | 0.30%  | 0.28%  | 0.44%  | 0.19%  | 0.07%  |
| Speculative Grade                   | 6.54%  | 5.15%  | 14.29% | 5.84%  | 5.50%  |
| All Ratings                         | 0.91%  | 0.71%  | 1.29%  | 0.43%  | 0.31%  |

Most of the new 2005 HEL impairments were originated in 2000 and 2001. All but four involved subprime mortgage as their collateral. The remaining four impaired tranches were either backed by reperforming loans or backed by nonperforming mortgage loans, which have experienced serious payment difficulties in the past.

While the overall performance in the HEL sector has been solid across all vintages, Figure 14 shows that the 1999 vintage HEL securities on average performed worse than others. In addition, as of year-end 2005, the lifetime impairment rates among the 2001, 2002 and 2003 vintages were particularly low. HEL securities issued since 2003 recorded no impairments.

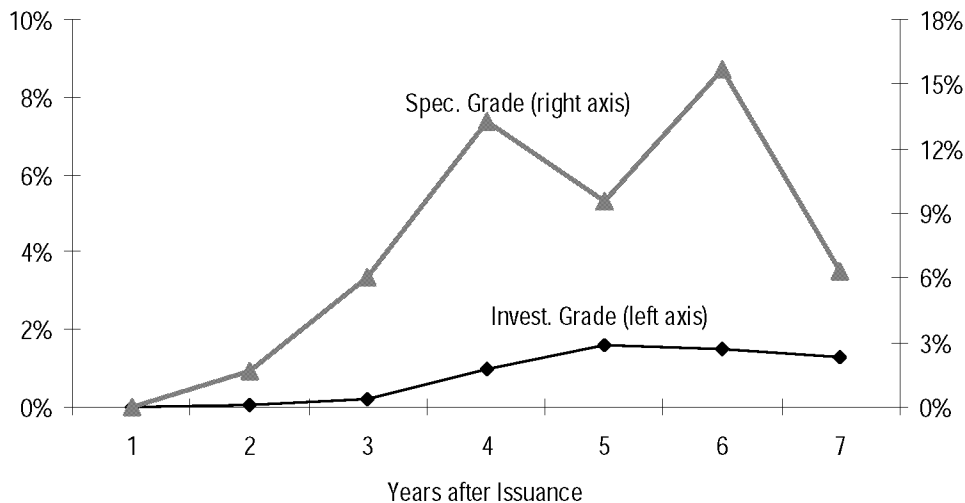
**Figure 14 – HEL Lifetime Impairment Rates by Original Rating on Securities Issued during 1999-2003**

| Original Rating   | 1999 Vintage | 2000 Vintage | 2001 Vintage | 2002 Vintage | 2003 Vintage |
|-------------------|--------------|--------------|--------------|--------------|--------------|
| Aaa               | 0.0%         | 0.0%         | 0.0%         | 0.0%         | 0.0%         |
| Aa                | 0.0%         | 0.0%         | 0.0%         | 0.0%         | 0.0%         |
| A                 | 0.0%         | 2.8%         | 0.7%         | 0.0%         | 0.0%         |
| Baa               | 8.5%         | 11.4%        | 6.2%         | 0.7%         | 0.0%         |
| Ba                | 40.0%        | 0.0%         | 17.2%        | 4.2%         | 0.0%         |
| B                 | 71.4%        | 0.0%         | 0.0%         | 0.0%         | 0.0%         |
| Caa               | n/a          | n/a          | n/a          | n/a          | n/a          |
| Investment Grade  | 2.2%         | 3.5%         | 1.8%         | 0.2%         | 0.0%         |
| Speculative Grade | 52.9%        | 0.0%         | 16.1%        | 3.8%         | 0.0%         |
| All Ratings       | 6.7%         | 3.3%         | 2.6%         | 0.3%         | 0.0%         |

*Note: Lifetime impairment rate is the total number of impaired securities (to date) as a share of all securities issued.*

The HEL sector also exhibits some interesting seasoning patterns. Figure 15 depicts the sector's steep increase in the first four years after issuance in the marginal impairment rate of the speculative-grade category. Like in the US ABS sector as a whole, investment-grade marginal impairment rates peaked in the fifth year, and then in the sixth and seven years, remained similar to the fifth year level.

**Figure 15 – HEL Marginal Impairment Rates by Years after Issuance, 1993-2005**



### US CMBS: IMPAIRMENT RATES REMAINED LOW

The CMBS sector continued to exhibit excellent credit performance overall and a perfect record in the investment-grade category. For the second year in a row, no securities rated investment grade at the beginning of a year became impaired within the year (see Figure 16). There were 32 newly impaired tranches from 19 transactions in the CMBS sector, and all but three were conduit deals. The remaining three were large loan deals. Twenty of the impaired tranches were previously impaired, subsequently cured, and became impaired again in 2005. In other words, only 12 securities experienced payment defaults for the first time in 2005.

Of the 32 newly impaired CMBS tranches in 2005, 19 were rated Caa, Ca or C as of year-end 2005 and were expected to sustain some losses ultimately. Only six of the 32 tranches have so far suffered principal losses.

By rating at the beginning of the year, the one-year impairment rate in the speculative-grade category inched up to 2.9% in 2005 from 2.6% in 2004.

**Figure 16 – US CMBS One-Year Impairment Rates by Rating at the Beginning of the Year**

| Rating at the Beginning of the Year | 2001  | 2002  | 2003   | 2004   | 2005   |
|-------------------------------------|-------|-------|--------|--------|--------|
| Aaa                                 | 0.00% | 0.00% | 0.00%  | 0.00%  | 0.00%  |
| Aa                                  | 0.00% | 0.00% | 0.00%  | 0.00%  | 0.00%  |
| A                                   | 0.00% | 0.00% | 0.23%  | 0.00%  | 0.00%  |
| Baa                                 | 0.00% | 0.37% | 1.05%  | 0.00%  | 0.00%  |
| Ba                                  | 1.23% | 0.40% | 0.81%  | 0.00%  | 1.07%  |
| B                                   | 1.86% | 2.60% | 2.50%  | 3.66%  | 2.59%  |
| Caa                                 | 5.88% | 0.00% | 20.00% | 23.68% | 21.88% |
| Investment Grade                    | 0.00% | 0.14% | 0.44%  | 0.00%  | 0.00%  |
| Speculative Grade                   | 1.74% | 1.39% | 2.34%  | 2.56%  | 2.89%  |
| All Ratings                         | 0.44% | 0.46% | 0.98%  | 0.77%  | 0.90%  |

Within the CMBS sector, the 2000 vintage performed worse than other vintages (Figure 17).<sup>4</sup> There were 28 impaired securities in that vintage, and 14 of them experienced principal losses or were downgraded to Ca or C and were expected to sustain significant principal losses. As a result, the lifetime impairment rates in both the investment-grade and speculative-grade categories were higher in the 2000 vintage than in other vintages.

**Figure 17 – US CMBS Lifetime Impairment Rates by Original Rating on Securities Issued during 1999-2003**

| Original Rating   | 1999 Vintage | 2000 Vintage | 2001 Vintage | 2002 Vintage | 2003 Vintage |
|-------------------|--------------|--------------|--------------|--------------|--------------|
| Aaa               | 0.0%         | 0.0%         | 0.0%         | 0.0%         | 0.0%         |
| Aa                | 0.0%         | 0.0%         | 0.0%         | 0.0%         | 0.0%         |
| A                 | 0.0%         | 2.4%         | 0.0%         | 0.0%         | 0.0%         |
| Baa               | 0.0%         | 3.7%         | 2.4%         | 0.0%         | 0.0%         |
| Ba                | 0.0%         | 3.1%         | 6.7%         | 2.7%         | 0.0%         |
| B                 | 17.9%        | 25.0%        | 14.3%        | 3.3%         | 1.1%         |
| Caa               | 44.4%        | 33.3%        | 33.3%        | 0.0%         | 0.0%         |
| Investment Grade  | 0.0%         | 2.1%         | 1.1%         | 0.0%         | 0.0%         |
| Speculative Grade | 12.0%        | 14.5%        | 10.5%        | 2.9%         | 0.5%         |
| All Ratings       | 3.4%         | 5.6%         | 3.6%         | 0.9%         | 0.1%         |

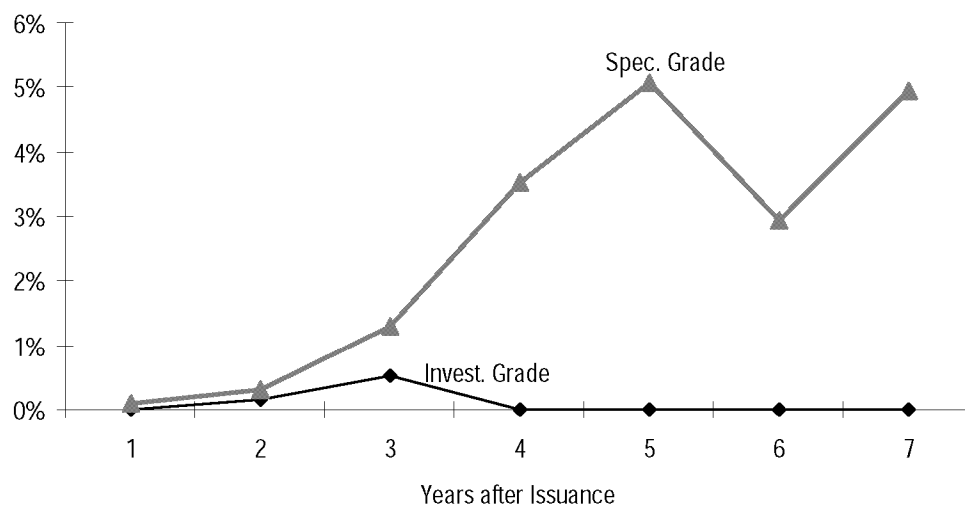
*Note: Lifetime impairment rate is the total number of impaired securities to date as a share of all securities issued.*

The seasoning patterns of the marginal impairment rates for CMBS shared some similarities with those in the HEL sector, although there were also important distinctions. In the speculative-grade category, the marginal impairment rates increased significantly over the first five years after issuance, peaking in the fifth year. By comparison, the marginal impairment rates for HEL peaked in the fourth year (see Figure 18).

In the investment-grade category, the seasoning pattern was much weaker because of the very small number of impairments in this CMBS category. Nonetheless, the marginal impairment rates increased in the first three years after issuance before declining to zero in the fourth year.

4. See additional discussions in the CMBS section of Moody's Special Comment, "Structured Finance Rating Transitions: 1983-2005," February 2006.

**Figure 18 – US CMBS Marginal Impairment Rates by Years after Issuance, 1993-2005**



**US RMBS: IMPAIRMENT RATES ROSE IN THE SPECULATIVE-GRADE CATEGORY**

Similar to the CMBS sector, the RMBS sector, which mainly includes transactions backed by prime and Alt-A residential mortgages, demonstrated superb credit performance in recent years. Nine securities were impaired for the first time in 2005, and two (backed by Quality Mortgage USA Inc. loans, which contributed to most of the RMBS impairments in our data sample) were previously impaired, subsequently cured, and then became impaired again in 2005, resulting in a total of 11 new impairments in this sector in 2005.

The nine newly impaired RMBS tranches involved just five transactions, of which four were backed by pools with a considerable proportion of Alt-A mortgage loans. All but one of these nine impaired tranches were downgraded to the Ca or C category, either because they had already experienced significant principal losses, or were expected shortly.

By rating at the beginning of the year, the 2005 impairment rates remained at low levels in the investment-grade categories. In the speculative-grade category, while the overall level was still low, the impairment rate did edge up to 1.5% in 2005 from 0.6% in 2004 (Figure 19).

**Figure 19 – US RMBS One-Year Impairment Rates by Rating at the Beginning of the Year**

| Rating at the Beginning of the Year | 2001   | 2002  | 2003   | 2004  | 2005   |
|-------------------------------------|--------|-------|--------|-------|--------|
| Aaa                                 | 0.00%  | 0.00% | 0.00%  | 0.00% | 0.00%  |
| Aa                                  | 0.00%  | 0.00% | 0.00%  | 0.00% | 0.00%  |
| A                                   | 0.00%  | 0.00% | 0.21%  | 0.54% | 0.00%  |
| Baa                                 | 0.31%  | 0.51% | 0.40%  | 0.19% | 0.40%  |
| Ba                                  | 1.27%  | 0.58% | 0.87%  | 0.77% | 1.19%  |
| B                                   | 3.33%  | 1.00% | 0.00%  | 0.57% | 1.46%  |
| Caa                                 | 16.67% | 0.00% | 20.00% | 0.00% | 28.57% |
| Investment Grade                    | 0.05%  | 0.09% | 0.09%  | 0.11% | 0.07%  |
| Speculative Grade                   | 2.34%  | 0.68% | 0.69%  | 0.64% | 1.45%  |
| All Ratings                         | 0.33%  | 0.15% | 0.17%  | 0.17% | 0.21%  |

Across vintages, securities issued in 1999, 2000 and 2003 had perfect payment records with no impairments to date. The performance of the 2001 and 2002 vintages was largely similar (see Figure 20).

**Figure 20 – US RMBS Lifetime Impairment Rates by Original Rating on Securities Issued during 1999-2003**

| Original Rating   | 1999 Vintage | 2000 Vintage | 2001 Vintage | 2002 Vintage | 2003 Vintage |
|-------------------|--------------|--------------|--------------|--------------|--------------|
| Aaa               | 0.0%         | 0.0%         | 0.0%         | 0.0%         | 0.0%         |
| Aa                | 0.0%         | 0.0%         | 0.0%         | 0.0%         | 0.0%         |
| A                 | 0.0%         | 0.0%         | 0.0%         | 1.9%         | 0.0%         |
| Baa               | 0.0%         | 0.0%         | 1.8%         | 0.5%         | 0.0%         |
| Ba                | 0.0%         | 0.0%         | 4.7%         | 1.7%         | 0.0%         |
| B                 | 0.0%         | 0.0%         | 3.2%         | 2.4%         | 0.0%         |
| Caa               | n/a          | n/a          | n/a          | n/a          | n/a          |
| Investment Grade  | 0.0%         | 0.0%         | 0.3%         | 0.5%         | 0.0%         |
| Speculative Grade | 0.0%         | 0.0%         | 4.1%         | 2.0%         | 0.0%         |
| All Ratings       | 0.0%         | 0.0%         | 0.7%         | 0.7%         | 0.0%         |

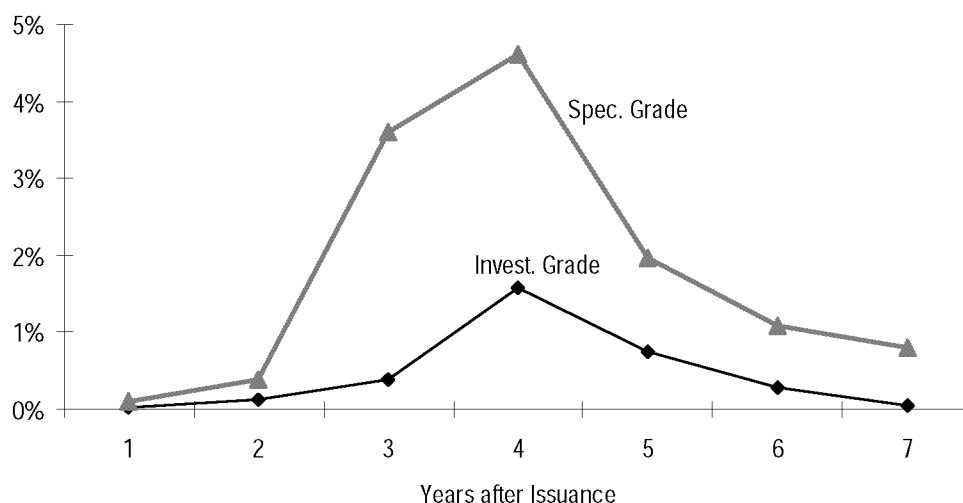
*Note: Lifetime impairment rate is the total number of impaired securities to date as a share of all securities issued.*

Using all the data in the sample, Figure 21 reports a seasoning pattern of marginal impairment rates in the RMBS sector that is different from those in the HEL and CMBS sectors (Figures 15 and 18).

First, there was a clean hump in the marginal impairment rates of RMBS tranches. The impairment rates peaked in the fourth year for both investment-grade and speculative-grade securities, before declining precipitously in the fifth and sixth years after issuance.

Second, compared to the HEL and CMBS marginal impairment rates, the RMBS marginal impairment rates were more front-loaded. The impairment rates jumped in the third year after issuance in the speculative-grade category, and the fourth year after issuance in the investment-grade category. More importantly, the marginal impairment rates were significantly lower in the sixth and seventh years than those in the third and fourth years after issuance.

**Figure 21 – US RMBS Marginal Impairment Rates by Years after Issuance, 1993-2005**



### GLOBAL CDOs: IMPAIRMENT RATES PLUNGED ACROSS ALL CATEGORIES

2005 was a banner year for global CDOs with just 15 newly impaired tranches, representing 0.3% of the total of 4,494 tranches outstanding. In fact, the 0.3% one-year impairment rate was the lowest since 1998 in this sector.

All but one of these new impairments were CDO tranches backed mainly by other structured finance securities (SF CDOs) (see Figure 22). Tranches from balance-sheet CDOs, CBOs, synthetic arbitrage CDOs, and other types of CDOs such as preferred-stock CDOs and market-value CDOs reported no new impairments. By comparison, the lifetime impairment rates were much higher with 29.4% among HY CBOs, and 4.7% among SF CDOs.

**Figure 22 – 2005 Global CDO New Impairments by Deal Type, Compared to Their Historical Totals**

|                         | Number of New Impairments in 2005 | Securities Outstanding in 2005 | 2005 Impairment Rate | Number of Impairments, 1993-2005 | Securities Issued, 1993-2004 | Lifetime Impairment Rate |
|-------------------------|-----------------------------------|--------------------------------|----------------------|----------------------------------|------------------------------|--------------------------|
| Balance Sheet Cash Flow | 0                                 | 148                            | 0.0%                 | 2                                | 244                          | 0.8%                     |
| Balance Sheet Synthetic | 0                                 | 213                            | 0.0%                 | 17                               | 335                          | 5.1%                     |
| Emerging Market         | 0                                 | 37                             | 0.0%                 | 1                                | 77                           | 1.3%                     |
| HY CBOs                 | 0                                 | 380                            | 0.0%                 | 182                              | 620                          | 29.4%                    |
| HY CLOs                 | 1                                 | 1,058                          | 0.1%                 | 14                               | 1,135                        | 1.2%                     |
| IG CBOs                 | 0                                 | 133                            | 0.0%                 | 8                                | 148                          | 5.4%                     |
| Market Value            | 0                                 | 80                             | 0.0%                 | 2                                | 118                          | 1.7%                     |
| SF CDOs                 | 14                                | 1,150                          | 1.2%                 | 59                               | 1,258                        | 4.7%                     |
| Synthetic Arbitrage     | 0                                 | 973                            | 0.0%                 | 18                               | 1,082                        | 1.7%                     |
| Other CDOs              | 0                                 | 322                            | 0.0%                 | 0                                | 454                          | 0.0%                     |
| All CDOs                | 15                                | 4,494                          | 0.3%                 | 303                              | 5,471                        | 5.5%                     |

*Note: Other CDOs include deals backed by preferred stocks, distressed debts, small-middle market loans, and collateralized fund obligations.*

Two pari passu HY CLO tranches (belonging to Archimedes Funding and counted as a single tranche in this report) started PIKing in 2001. The PIK payment default was cured three years later in early 2005; however, the same securities sustained a substantial amount of principal loss in November 2005. As a share of outstanding CLO tranches, the one-year impairment rate was a tiny 0.1% in 2005, compared to the category's 1.2% lifetime impairment rate.

In 2005, we observed a number of CDO tranches that had experienced interest deferrals or PIKed that had their payment defaults cured. For some CDO deal types such as CLOs, the cure rate has proven to be fairly large (Figure 23). Many of these cures occurred as a result of declining corporate default rates and improved recovery values of the defaulted assets. Even for the troubled HYCBO category, 34 of the total 194 tranches in payment defaults were subsequently cured. As exemplified, however, by the Archimedes Funding example cited above, cured tranches can default again, and in some cases sustain ultimate principal losses, especially if they were lowly rated at the end of our study period.

**Figure 23 – Distribution of Cured and Uncured CDO Payment Defaults by Selected Deal Type, 1993-2005**

| Deal Type | Total Payment Defaults | Cured | Uncured | Cure Rate | Uncured Rate |
|-----------|------------------------|-------|---------|-----------|--------------|
| EM        | 5                      | 4     | 1       | 80%       | 20%          |
| HYCBO     | 194                    | 34*   | 160     | 18%       | 82%          |
| HYCLO     | 26                     | 13    | 13      | 50%       | 50%          |
| IGCBO     | 6                      | 1     | 5       | 17%       | 83%          |
| SFCDO     | 54                     | 4     | 50      | 7%        | 93%          |

*\*Note: Nine of these had been downgraded to a Ca or C rating and were expected to suffer ultimate principal losses, and hence they were still kept on our impairment list.*

By rating at the beginning of the year, four, or 0.1%, of the investment-grade securities became impaired in 2005, all as a result of interest deferrals (Figure 24). The one-year impairment rate in the speculative-grade category fell steeply to 1.7% in 2005, from 4.2% in 2004 and 9.0% in 2003.

**Figure 24 – Global CDO One-Year Impairment Rates by Rating at the Beginning of the Year**

| Rating at the Beginning of the Year | 2001    | 2002   | 2003   | 2004   | 2005  |
|-------------------------------------|---------|--------|--------|--------|-------|
| Aaa                                 | 0.00%   | 0.00%  | 0.00%  | 0.00%  | 0.00% |
| Aa                                  | 0.00%   | 0.00%  | 0.22%  | 0.14%  | 0.11% |
| A                                   | 0.00%   | 2.45%  | 1.12%  | 0.32%  | 0.00% |
| Baa                                 | 5.18%   | 9.32%  | 1.99%  | 1.92%  | 0.34% |
| Ba                                  | 5.80%   | 15.18% | 3.93%  | 1.83%  | 0.92% |
| B                                   | 24.39%  | 38.24% | 15.29% | 4.98%  | 4.37% |
| Caa                                 | 100.00% | 62.50% | 37.36% | 18.33% | 3.20% |
| Investment Grade                    | 1.64%   | 3.19%  | 0.84%  | 0.57%  | 0.10% |
| Speculative Grade                   | 12.08%  | 20.52% | 9.03%  | 4.15%  | 1.71% |
| All Ratings                         | 3.61%   | 6.33%  | 2.32%  | 1.15%  | 0.33% |

CDO performance also improved steadily across vintages, as the lifetime impairment rates dropped from 20.6% within the 1999 vintage to 1.5% and 0% within the 2002 and 2003 vintages (see Figure 25). In addition, these improvements were evident across all rating categories.

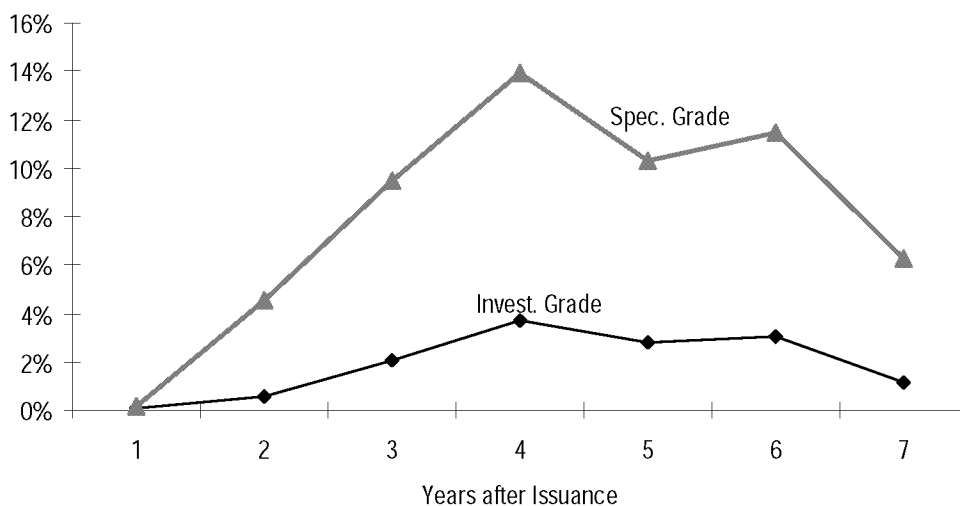
**Figure 25 – Global CDO Lifetime Impairment Rates by Original Rating on Securities Issued during 1999-2003**

| Original Rating   | 1999 Vintage | 2000 Vintage | 2001 Vintage | 2002 Vintage | 2003 Vintage |
|-------------------|--------------|--------------|--------------|--------------|--------------|
| Aaa               | 0.0%         | 0.0%         | 0.0%         | 0.0%         | 0.0%         |
| Aa                | 3.2%         | 2.4%         | 1.5%         | 0.0%         | 0.0%         |
| A                 | 12.7%        | 10.2%        | 1.9%         | 1.0%         | 0.0%         |
| Baa               | 35.2%        | 20.6%        | 15.6%        | 3.2%         | 0.0%         |
| Ba                | 40.7%        | 29.1%        | 11.0%        | 6.6%         | 0.0%         |
| B                 | 59.3%        | 22.2%        | 12.5%        | 0.0%         | 0.0%         |
| Caa               |              |              |              |              |              |
| Investment Grade  | 13.9%        | 8.7%         | 5.1%         | 1.0%         | 0.0%         |
| Speculative Grade | 46.5%        | 28.4%        | 11.1%        | 6.2%         | 0.0%         |
| All Ratings       | 20.6%        | 11.8%        | 6.0%         | 1.5%         | 0.0%         |

*Note: Lifetime impairment rate is the total number of impaired securities to date as a share of all securities issued.*

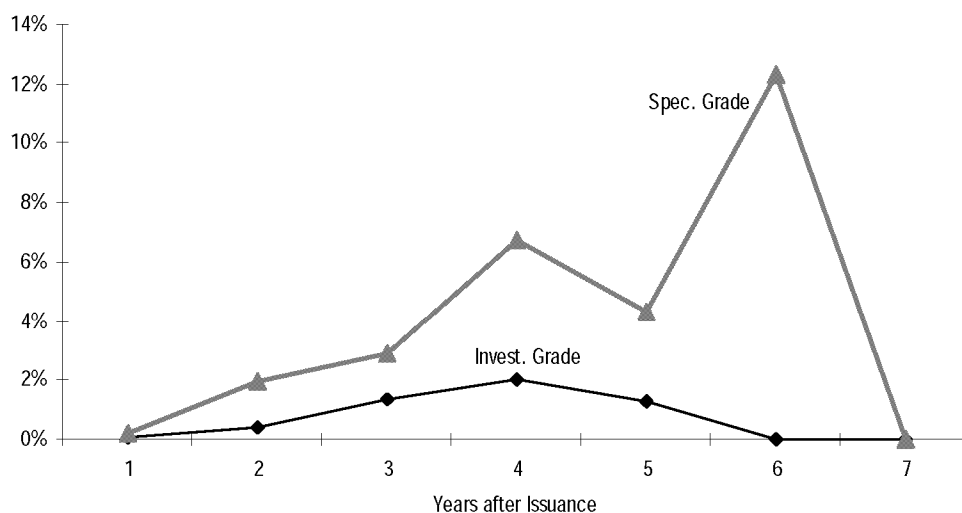
Figure 26 describes the seasoning patterns of CDO marginal impairment rates. The marginal impairment rates rose steadily in the first four years before they declined in the fifth year in both the speculative-grade and investment-grade categories. Similar to our findings in the ABS and HEL sectors, the marginal impairment rates in the fifth and sixth years after issuance were significantly above zero.

**Figure 26 – Global CDO Marginal Impairment Rates by Years after Issuance, 1993-2005**



By comparison, the marginal impairment rates of CDOs excluding HYCBOs were much lower, and declined to zero in the sixth and seventh year for both the investment-grade and speculative-grade categories (see Figure 27).

**Figure 27 – Global CDO (excluding HYCBOs) Marginal Impairment Rates by Years after Issuance, 1993-2005**



## Loss Severity Rates on Impaired Tranches by Sector, Rating, and Horizon

This section presents analysis of loss severity rates, also known as loss-given-default (LGD) rates, and combines information on loss severity rates with data on material impairment rates to derive cumulative loss rates. Estimating expected final LGD on defaulted structured finance securities is particularly challenging because most securitizations are structured as pass-through securities, and market prices are rarely available for structured securities in default. In previous research, we developed models to estimate final LGD for defaulted tranches backed by residential mortgage collateral and for defaulted collateralized bond obligations. In this report, we update those models and apply their results to other asset classes to derive estimated aggregate loss rates.

Moody's regularly updates the payment and loss records of defaulted structured finance securities. For each tranche, we are able to calculate the present value of losses (to date). For many tranches, the loss rate to date is effectively the final loss severity because their balances have been written down to zero at or before their final maturity. Many other defaulted tranches, however, have positive balances and potential sources of future cash distributions to investors; hence, their expected final loss severity rates need to be estimated.

### FINAL LGD OF MATURED DEFAULTS IN ALL STRUCTURED FINANCE AVERAGED 53%

We first examine a total of 352 matured defaults in structured finance overall.<sup>5</sup> The sample size of these matured defaults is now large enough for a comprehensive review. "Matured" defaults are defined to be securities whose balances were either partially or completely written down to zero by the end of 2005. All other impaired securities are called "non-matured" defaults. Our present data sample consists of 352 matured defaults and 589 non-matured defaults that were not cured. Figure 28 provides descriptive statistics regarding the realized final LGD rates of all matured defaults. LGD rates as a share of both original balance and impairment-date balance (the principal balance at the time of impairment) are reported.

5. We use the terms "default" and "impairment" interchangeably when the context is clear. For example, in this section, a security in material impairment is also in payment default (uncured)



**Figure 28 – Realized Final LGD Rates by Rating for All Matured Defaults in the All Structured Finance Category, 1993-2005<sup>6</sup>**

| By original rating (% of original balance) |        |       |        |         | By rating at impairment (% of impairment-date balance) |        |       |        |         |
|--|--------|-------|--------|---------|--|--------|-------|--------|---------|
| Rating at origination                      | Counts | Mean  | Median | Std Dev | Rating at impairment                                   | Counts | Mean  | Median | Std Dev |
| Aaa  | 6      | 2.6%  | 2.9%   | 1.1%    | Aaa  | 0      |       |        |         |
| Aa   | 15     | 28.4% | 15.0%  | 28.5%   | Aa   | 1      | 2.8%  | 2.8%   | n/a     |
| A  | 29     | 52.0% | 69.2%  | 32.7%   | A  | 7      | 47.5% | 22.9%  | 45.4%   |
| Baa  | 137    | 51.7% | 58.8%  | 31.4%   | Baa  | 53     | 63.0% | 94.6%  | 41.2%   |
| Ba   | 93     | 53.9% | 60.7%  | 33.1%   | Ba   | 90     | 72.0% | 93.9%  | 36.7%   |
| B  | 70     | 63.8% | 73.1%  | 32.3%   | B  | 103    | 74.0% | 94.0%  | 35.0%   |
| Caa  | 2      | 78.1% | 78.1%  | 9.5%    | Caa  | 98     | 72.0% | 83.7%  | 34.5%   |
| Investment Grade                           | 187    | 48.3% | 53.4%  | 32.5%   | Investment Grade                                       | 61     | 60.2% | 93.7%  | 41.9%   |
| Speculative Grade                          | 165    | 58.4% | 67.9%  | 32.9%   | Speculative Grade                                      | 291    | 72.7% | 92.9%  | 35.3%   |
| All Rating                                 | 352    | 53.0% | 64.8%  | 33.0%   | All Rating   | 352    | 70.5% | 92.9%  | 36.8%   |

The descriptive statistics have at least three notable implications:

First, impaired tranches that were rated higher experienced lower loss severity. In particular, those rated Aaa lost only a tiny fraction (3%) of their original balance, while those rated Aa lost less than 30% of their original balance.<sup>7</sup> The impaired tranches that were rated single-B and Caa at origination had much higher loss severity rates than were those rated single-A, Baa and Ba.

Second, the distribution of LGD rates within certain rating categories was skewed. For example, the median LGD rates of Aa-rated securities were much lower than their means, suggesting that more than half of the impaired Aa-securities suffered LGD rates that were lower than their means. In addition, the medians were higher than the means in the Baa, Ba and single-B categories, implying that in these categories there were more than half of the securities with LGD rates higher than their means.

Third, by rating at impairment, securities rated Aa suffered only minor losses, but those rated Baa or below lost a significant amount with their medians at above 90% of their impairment-date balance.

In addition to the differentiation of LGD rates by rating, there were also large differences across sectors among matured defaults. Figure 29 summarizes the final LGD rates by sector and reveals three interesting findings.

First, for impaired tranches that were rated investment grade, the LGD rates were the lowest in the CMBS sector and the highest in the ABS sector.<sup>8</sup> The LGD rates of impaired RMBS and HEL tranches were generally between those in the ABS and CMBS categories, and the average RMBS LGD rates were lower than the average HEL LGD rates. Additionally, CDO tranches that were impaired and carried an investment-grade rating at origination generally experienced LGD rates that were lower than those of ABS tranches but higher than those of RMBS and HEL tranches.

Second, for impaired tranches that were rated speculative grade, the LGD rates were much lower in the RMBS and HEL sectors than in the ABS and CDO sectors. The LGD rates of speculative-grade securities in the CMBS sector were ranked in between those of RMBS/HEL and ABS/CDOs.

Third, the variation of final LGD rates within the investment-grade and speculative-grade categories differed across sectors. The standard deviation of LGD rates was much larger in both rating grade categories in the CDO sector than in the ABS sector, whereas those in the CMBS, HEL, and RMBS sectors appeared to be similar.

6. In a Moody's Special Comment, "Measuring Loss Severity Rates of Defaulted Residential Mortgage-Backed Securities: A Methodology," we compared LGD rates of matured and non-matured tranches, and found that there was a survival bias in the sense that non-matured defaults were expected to sustain lower final LGD rates than were matured defaults.

7. Impaired health care receivable ABS tranches involving a number of NPF transactions were not included in this calculation.

8. Most of the investment-grade impairments were Baa-rated. Therefore, the contrast of LGD rates across sectors reflects their differences at the Baa rating level as well.

**Figure 29 – Realized Final LGD Rates by Sector for All Matured Defaults, 1993-2005**

**Rated Investment Grade at Origination**

(LGD as a share of original balance)

| Sector | Counts | Mean  | Median | Std Dev |
|--------|--------|-------|--------|---------|
| ABS    | 80     | 67.1% | 71.7%  | 14.7%   |
| CDO    | 25     | 54.2% | 34.0%  | 44.7%   |
| CMBS   | 7      | 22.9% | 7.0%   | 32.4%   |
| HEL    | 17     | 39.4% | 34.6%  | 32.8%   |
| RMBS   | 58     | 25.6% | 14.9%  | 27.4%   |

**Rated Speculative Grade at Origination**

(LGD as a share of original balance)

| Sector | Counts | Mean  | Median | Std Dev |
|--------|--------|-------|--------|---------|
| ABS    | 49     | 76.4% | 81.2%  | 15.2%   |
| CDO    | 17     | 72.9% | 100.0% | 55.8%   |
| CMBS   | 18     | 63.0% | 77.7%  | 29.7%   |
| HEL    | 31     | 40.9% | 43.2%  | 23.8%   |
| RMBS   | 50     | 45.0% | 43.8%  | 30.8%   |

**ESTIMATED FINAL LGD RATES ON IMPAIRED RMBS AND HEL TRANCHES AVERAGED 32%**

After incorporating the 2005 payment and loss data, the total number of uncured payment defaults in the RMBS and HEL sectors increased to 272.<sup>9</sup> Using the expanded data sample, we validated our previous LGD projection model.<sup>10</sup>

Figure 30 summarizes our latest LGD estimates, which are slightly higher but roughly the same as those reported in our previous studies. Specifically, securities rated Aaa and Aa at origination continued to show very low LGD rates, and the speculative-grade rated securities lost about 15 percentage points more than the investment-grade rated securities did.

**Figure 30 – Estimated Final LGD Rates by Rating for Impaired RMBS/HEL Securities, 1987-2005**

| By Original Rating (% of original balance) |        |       |        |         | By Rating at Impairment (% of impairment-date balance) |        |       |        |         |
|--|--------|-------|--------|---------|--|--------|-------|--------|---------|
|  | Counts | Mean  | Median | Std Dev |  | Counts | Mean  | Median | Std Dev |
| Aaa  | 11     | 2.3%  | 2.8%   | 1.2%    | Aaa  | 0      |       |        |         |
| Aa   | 25     | 8.7%  | 6.9%   | 7.4%    | Aa   | 3      | 3.7%  | 2.8%   | 2.8%    |
| A  | 19     | 25.0% | 24.3%  | 19.8%   | A  | 9      | 29.1% | 22.9%  | 30.6%   |
| Baa  | 115    | 32.6% | 29.7%  | 24.8%   | Baa  | 53     | 36.5% | 32.4%  | 30.7%   |
| Ba   | 52     | 32.3% | 28.0%  | 23.9%   | Ba   | 69     | 47.2% | 41.6%  | 30.8%   |
| B  | 50     | 51.8% | 59.5%  | 27.4%   | B  | 90     | 56.5% | 51.2%  | 32.6%   |
| Caa  | 0      |       |        |         | Caa  | 48     | 55.7% | 50.7%  | 33.3%   |
| Investment Grade                           | 170    | 26.3% | 20.4%  | 24.0%   | Investment Grade                                       | 65     | 34.0% | 25.4%  | 30.5%   |
| Speculative Grade                          | 102    | 41.8% | 39.3%  | 27.4%   | Speculative Grade                                      | 207    | 53.2% | 48.7%  | 32.3%   |
| All Ratings                                | 272    | 32.1% | 26.4%  | 26.3%   | All Ratings  | 272    | 48.6% | 42.8%  | 32.9%   |

*Note: Defaults are identified as of December 31, 2005; however, loss severity rate statistics are updated through January 2006. This table combines both matured and non-matured tranches. Statistics for non-matured defaults are not presented separately. Please refer to Moody's Special Comment, "Measuring Loss Severity Rates of Defaulted Mortgage Backed Securities," for comparisons of LGD and other sample characteristics between matured and non-matured subsamples.*

9. Only defaulted and uncured securities - impaired tranches - are included in the study of loss severity rates. Including loss severity rates for all defaulted securities, including cured ones, would of course lead to lower estimates, particularly in the investment grade category where most cured defaults are observed. In addition, this total does not include resecured RMBS transactions (deals backed by other subordinated mortgage-backed securities like CDOs) and non-standard HEL transactions such as deals backed by home improvement loans and net interest margins.

10. The model, described first in a April 2004 Special Comment, "Measuring Loss Severity Rates of Defaulted Mortgage Backed Securities," takes into account both static factors such as tranche size and time to default and dynamic factors such as the speed of loss accumulation to date. With the latest data, the model remains basically unchanged. The default-date-balance variable in the static model loses its significance, and is therefore dropped from the current model. In addition, the loss deceleration parameter "beta" has gone down from 0.33 (used in last year's report) to 0.30, whereas the weight variable "alpha" has increased from 0.08 (used in last year's report) to 0.09, implying more weights placed on the dynamic LGD estimates.

## ESTIMATED FINAL LGD RATES ON IMPAIRED CDO TRANCHES AVERAGED 72%

In our first study of CDO defaults and losses, we derived a simple model to project final LGD rates for defaulted high-yield CBO tranches, which have historically experienced the greatest number of defaults within the broader CDO sector. At present, we continue to use the same model we derived for CBOs and apply it to all impaired cash SF CDOs and CLOs.<sup>11</sup> Figure 31 summarizes the estimated final LGD rates of all impaired CDOs including both matured and non-matured, cash and synthetic securities, some of which were from European transactions.

**Figure 31 – Estimated Final LGD Rates by Rating for Impaired CDO Securities, 1993-2005**

|                   | By original rating (% of original balance) |       |        |         | By rating at impairment (% of impairment-date balance) |      |        |         |       |
|-------------------|--|-------|--------|---------|--|------|--------|---------|-------|
|                   | Counts                                     | Mean  | median | Std Dev | Counts   | Mean | median | Std Dev |       |
| Aaa               | 0  |       |        |         | Aaa  | 0    |        |         |       |
| Aa                | 8  | 38.8% | 33.8%  | 30.8%   | Aa   | 0    |        |         |       |
| A                 | 18   | 64.3% | 82.6%  | 38.0%   | A  | 12   | 79.8%  | 100.0%  | 38.8% |
| Baa               | 132  | 66.8% | 79.0%  | 33.3%   | Baa  | 56   | 88.2%  | 100.0%  | 29.1% |
| Ba                | 56   | 81.0% | 100.0% | 31.0%   | Ba   | 56   | 88.8%  | 100.0%  | 29.1% |
| B                 | 36   | 89.2% | 100.0% | 23.8%   | B  | 70   | 81.5%  | 100.0%  | 34.3% |
| Caa               | 0  |       |        |         | Caa  | 56   | 80.6%  | 100.0%  | 33.3% |
| Investment Grade  | 158  | 65.1% | 78.6%  | 34.1%   | Investment Grade                                       | 68   | 86.7%  | 100.0%  | 30.9% |
| Speculative Grade | 92   | 84.2% | 100.0% | 28.5%   | Speculative Grade                                      | 182  | 83.5%  | 100.0%  | 32.5% |
| All Ratings       | 250  | 72.1% | 84.3%  | 33.4%   | All Ratings  | 250  | 84.4%  | 100.0%  | 32.0% |

*Note: Defaults are identified as of December 31, 2005; however, loss severity rate statistics are updated through January 2006. This table combines both matured and non-matured tranches. The sample size is smaller than the total number of impaired tranches in this sector because some impaired tranches lack complete information for predicting final LGD rates. Statistics for non-matured defaults are not presented separately. Please refer to Moody's Special Comment "Measuring Loss Severity Rates of Defaulted Mortgage Backed Securities," for comparisons of LGD and other sample characteristics between matured and non-matured subsamples.*

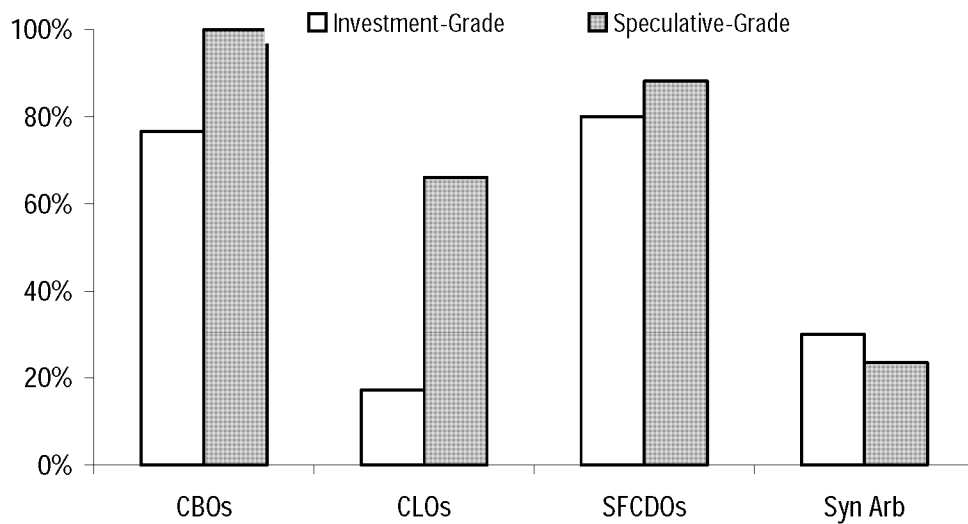
Figure 31 reveals several interesting findings about LGDs of impaired CDO tranches:

- LGD rates have varied systematically with original rating levels – single-B and Ba rated securities have experienced higher LGDs than securities rated Baa and single-A, which in turn have higher LGDs than Aa-rated securities.
- In contrast, LGD rates by impairment date balance were generally at similarly high levels across the various rating categories at the time of impairment.
- The median LGD rates were higher than the mean LGD rates for almost all rating categories except Aa, implying that there were more than half of the securities with LGD rates higher than the means.
- While the average LGD rates in the speculative-grade category were similar both as a share of original balance and as a share of impairment-date balance, in the investment-grade category, the LGD rates as a share of impairment-date balance averaged much higher than those as a share of original balance. This is largely the result of amortization (occurring first to more senior tranches) that made principal balances smaller than the balance at origination by the time the securities experienced impairments.

The LGD rates on impaired CDO tranches also varied by deal type. Figure 32 highlights the similarities and differences in the estimated final LGD rates across four CDO deal types. In particular, the LGD rates were similar between CBOs (including both HY CBOs and Investment-Grade CBOs) and SF CDOs in the investment-grade category. In this same category, the LGD rates of impaired CLO and synthetic arbitrage tranches were much lower than those of CBOs and SF CDOs. In the speculative-grade category, however, the LGD rates of CBOs and SF CDOs were similar, and higher than those of CLOs and synthetic arbitrage CDOs.

11. See "Default & Loss Rates of U.S. CDOs: 1993-2003," Moody's Special Comment, March 2005. The model uses the weighted average rating factor (WARF) and the weighted average maturity (WAM), as reported by Moody's deal performance reports, to find the weighted average loss rates expected in the pool. These expected pool loss rates are used to adjust the 2005 year-end OC ratios, after taking into account the potential excess interests that would become available in the deal, if any excess exists. The adjusted OC ratios are then used to derive future payments available to the impaired tranches and compute the tranches' projected loss rates.

**Figure 32 – Estimated Final LGD Rates (% of Original Balance) on Impaired CDO Tranches by Deal Type and Original Rating, 1993-2005**

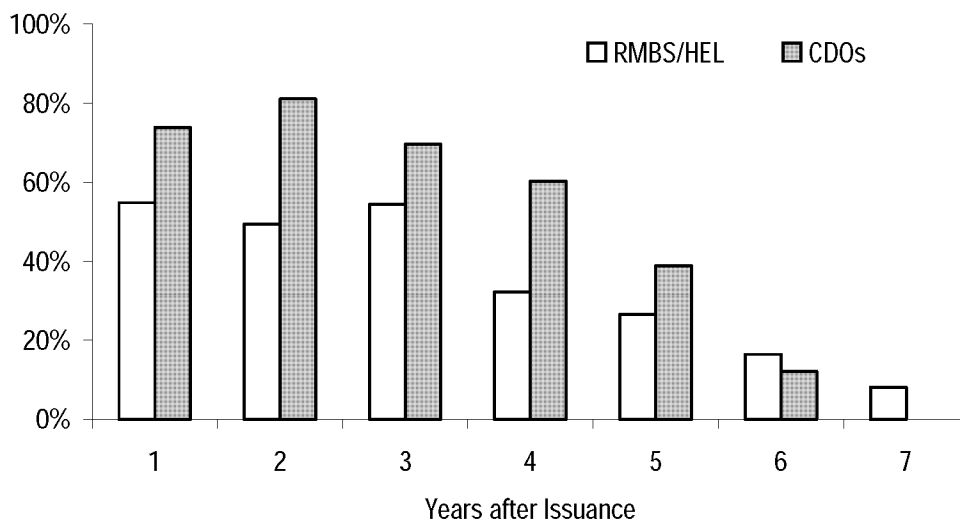


### COMPARING LGD RATES BY TIME HORIZON

One of the essential inputs of the multi-year cumulative loss rate calculations is the multi-year average LGD rates. Introducing time horizon into the LGD rate concept is necessitated by the possible change of ratings, the change of cohort-date principal balance, and discounting. The estimated average multi-year LGD rates therefore depend on how impairments are distributed over the time horizon, in contrast with the LGD rates we analyzed above, which were averages of LGD rates of the impaired tranches regardless of when the tranches were impaired.<sup>12</sup>

Figure 33 illustrates the time pattern of average multi-year LGD rates by year after issuance. For example, the average four-year LGD rate on securities that became impaired anytime within the first four years after issuance was about 32% in RMBS/HEL and about 60% in CDOs, compared to about 50% and 81% for securities that became impaired within the first two years after issuance in RMBS/HEL and CDOs, respectively.

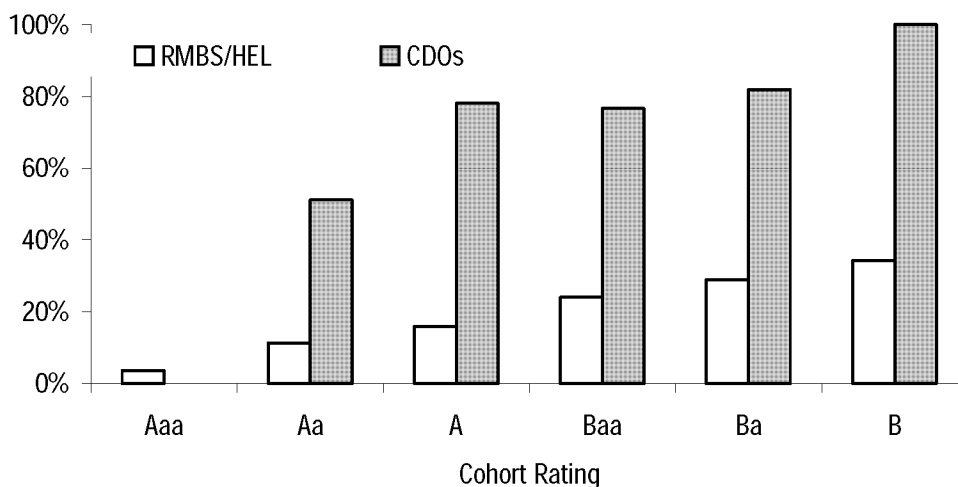
**Figure 33 – Estimated Average Multi-Year LGD Rates (% of Original Balance), 1993-2005**



12. See Moody's Special Comment, "Default & Loss Rates of Structured Finance Securities: 1993-2003."

In addition to the original-rating-based impairment rate and LGD rates, Moody's also provides cohort-rating based impairment rate and LGD rates. Figure 34 compares the four-year LGD rates as a share of cohort-date balances, i.e. the principal balances at the beginning of the impairment year and of each of the years prior to the observed impairments. Figure 34 reveals that the cohort ratings, i.e. ratings at the beginning of a year, ranked-order LGD rates better in the RMBS/HEL sector than in the CDO sector.

**Figure 34 – Estimated Average Four-Year LGD Rates (% of Cohort-Date Balance) by Cohort Rating, 1993-2005**



*Note: Cohort ratings are ratings on securities outstanding at the beginning of a cohort horizon (four-year horizon in this Figure), regardless of when they were issued. The four-year LGD rates are the averages of realized LGD rates on tranches impaired in each of the four years, weighted by the incremental impairment rates of each year.*

## Multi-Year Cumulative Loss Rates by Rating and Sector

Multi-year cumulative loss rates are the product of multi-year cumulative impairment rates and multi-year cumulative LGD rates. To derive these multi-year loss rates, we continue to use the approach we employed in our previous report; namely, we combine the estimated LGD rates of non-matured impairments and the realized final LGD rates of matured impairments to derive the average LGD rates in the RMBS/HEL and CDO sectors. Further, we apply:

- the estimated LGD rates based on impaired RMBS and HEL tranches to the calculation of loss rates in the RMBS, HEL, RMBS/HEL sectors combined, and the CMBS sector;
- the estimated LGD rates based on impaired CDO tranches to the calculation of loss rates in the CDO sector;
- the equally-weighted averages of LGD rates in RMBS/HEL and CDOs to the calculation of loss rates in the ABS sector as well as in the all structured finance category.

Figure 35 provides the resulting estimated five-year cumulative loss rates by rating, with comparisons between original-rating and cohort-rating-based loss rates in structured finance and those in the corporate sector. Detailed multi-year cumulative loss rates by rating, horizon, and sector appear in Appendix 3.

**Figure 35 – Estimated Five-Year Cumulative Loss Rates by Rating for All Structured Finance, 1993-2005**

|                   | Global Structured Finance,<br>By Original Rating | Global Structured Finance,<br>By Cohort Rating | Global Corporate,<br>by Cohort Rating |
|-------------------|--|--|---------------------------------------|
| Aaa               | 0.017%   | 0.019%   | 0.004%                                |
| Aa                | 0.74%  | 0.85%  | 0.08%                                 |
| A                 | 1.78%  | 1.40%  | 0.23%                                 |
| Baa               | 5.81%  | 6.92%  | 1.24%                                 |
| Ba                | 8.65%  | 11.97%   | 7.04%                                 |
| B                 | 16.22%   | 17.95%   | 18.61%                                |
| Caa               | n/a  | 22.33%   | 37.70%                                |
| Investment Grade  | 2.04%  | 2.17%  | 0.77%                                 |
| Speculative Grade | 11.65%   | 15.06%   | 26.97%                                |
| All Ratings       | 3.16%  | 3.71%  | 6.97%                                 |

*Note: All structured finance securities are included. We assume that the LGD rates of all structured finance securities are the equally-weighted averages of the estimated LGD rates in RMBS and HEL and the estimated LGD rates in CDOs. Loss rates by cohort rating in the corporate sector are reproduced from Moody's 2005 corporate bond default study, "Default and Recovery Rates of Corporate Bond Issuers, 1920-2005," Moody's Special Comment, March 2005.*

These newly estimated loss rates by rating are largely similar to what we provided in previous reports. In particular:

- The estimated five-year loss rates continued to be increasing as ratings decrease, and the relationship between loss rates and ratings was similar between those measured by cohort rating and those measured by original rating.
- Moody's continues to observe generally higher loss rates when measured by cohort rating than by original rating in the all structured finance category. It is important to note that this ordering of loss rates between cohort rating and original rating does not hold for all asset classes and all time horizons.
- Estimated loss rates by original rating are slightly higher, relative to those in last year's report, mostly due to the increases in the estimated LGD rates at the fourth and fifth year horizons. By contrast, the estimated loss rates by cohort rating declined a bit, relative to our previously reported numbers.
- Estimated loss rates remain higher in structured finance as a whole than in the corporate sector. Variations continued to persist across different structured finance sectors, with the CMBS and RMBS sectors demonstrating the lowest loss rates by rating (Figure 36).

**Figure 36 – Estimated Five-Year Cumulative Loss rates by Sector and Cohort Rating, 1993-2005**

|                   | US CMBS | US RMBS | US HEL | Global CDOs<br>excl. HYCBOs | ABS excl. MH<br>HEL | Global Corporate |
|-------------------|---------|---------|--------|-----------------------------|---------------------|------------------|
| Aaa               | 0.000%  | 0.028%  | 0.000% | 0.000%                      | 0.027%              | 0.004%           |
| Aa                | 0.00%   | 0.06%   | 0.00%  | 0.92%                       | 2.69%               | 0.08%            |
| A                 | 0.09%   | 0.34%   | 0.47%  | 2.47%                       | 1.31%               | 0.23%            |
| Baa               | 0.36%   | 2.17%   | 3.42%  | 10.28%                      | 6.31%               | 1.24%            |
| Ba                | 1.40%   | 3.26%   | 10.25% | 12.60%                      | 21.46%              | 7.04%            |
| B                 | 9.06%   | 5.82%   | 22.44% | 27.63%                      | 28.04%              | 18.61%           |
| Caa               | 14.88%  | 19.77%  | n/a    | n/a                         | n/a                 | 37.70%           |
| Investment Grade  | 0.14%   | 0.51%   | 0.95%  | 3.73%                       | 1.67%               | 0.77%            |
| Speculative Grade | 5.70%   | 4.42%   | 14.19% | 17.07%                      | 25.71%              | 26.97%           |
| All Ratings       | 1.46%   | 1.00%   | 2.03%  | 5.67%                       | 2.69%               | 6.97%            |

Finally, it is important to note that all statistics presented in this report so far are not weighted by dollar volume, and we generally do not provide volume-based impairment and loss rates. Using the same data underlying Figure 35 (details appear in Appendix 3) and weighting them by the total original balances in each rating category, we find that overall five-year loss rates as a share of original balance averaged about 49 basis points for all securities combined – 1.7 basis points in the Aaa category, 2.3% for non-Aaa investment-grade securities, and 10.6% for speculative-grade securities.<sup>13</sup>

13. Moody's generally focuses on issue-weighted statistics, not volume-weighted statistics, because issue-weighted statistics are likely to be more useful in predicting future performance level of a wide variety of portfolios. The volume-weighted statistics are more representative of the average historical experience of individual investors.

## Appendix 1: Descriptions of Data Sample and Glossary

---

### DESCRIPTION OF DATA SAMPLE

The data sample for the study covers all structured finance rating observations globally between 1993 and 2005 and uses the following set of criteria:

- Only securities carrying long-term bond ratings are included, whereas short-term ratings, foreign national ratings, provisional ratings, and rating estimates are excluded.
- Tranches wrapped by financial guarantors, government agencies, or government sponsored enterprises (GSEs) are excluded.
- Interest-only (IO) tranches and residual tranches are excluded.
- Deals whose credit quality are entirely dependent on a single corporate rating, such as single borrower credit tenant lease (CTL) deals in CMBS, are excluded. Derivative ratings, which are generally linked to the credit rating of a single entity, are also excluded.
- Tranches carrying the same rating from the same deal are collapsed into a single rating observation, with the following exception: if two or more tranches share the same rating in the same deal, but are collateralized by distinct groups of loan pools, then the tranches are not collapsed.

During each year's update, Moody's not only adds new rating and default/loss data to the data sample, but also updates past data observations using the latest information from servicers and trustees, who periodically produces new reports as well as updates on their past reports. The number of outstanding securities, impairments, and the amount of losses may change depending on the securities' latest payment reports. In addition, small data errors may also have been discovered and corrected. As a result, past impairment and loss rates are subject to minor revisions. This report has incorporated all these necessary changes. Finally, the structured finance data set used in this study is available through Moody's Structured Finance Default Risk Service (DRS) database.

### GLOSSARY

#### *Payment Default*

Structured finance securities are defined as being in payment default if they have suffered:

- an interest shortfall, or
- a principal write-down.

Moody's identifies structured finance securities' interest shortfalls and principal write-downs by reviewing all of Moody's performance data reports, both in electronic and physical form. Prepayment-related interest shortfalls are not considered to be payment defaults, but PIKing tranches are. Only explicit principal write-downs are included as payment defaults as reported by servicers or trustees. Implicit principal losses or undercollateralizations are not included.

#### *Material Impairment*

Structured finance securities are defined as being in material impairment if they have:

- sustained a payment default that remained uncured, or
- been downgraded to Ca or C.

The impairment status of a security may change as it goes from cured (i.e. all outstanding shortfalls and losses were repaid in full) to uncured (i.e. positive interest shortfalls or principal losses outstanding), or vice versa. If any securities rated Ca or C but not in payment default are upgraded, they are considered to be no longer in material impairment. Securities rated Ca or C that were not upgraded are in material impairment even if their payment defaults have been cured. Finally, securities with very minor shortfalls or losses are excluded.

#### *One-Year Impairment Rate*

This is the number of securities that became newly impaired in a given year divided by the number of securities outstanding at the beginning of a year.

### ***Lifetime Impairment Rate***

This is the total number of impaired securities divided by the total number of securities issued over a particular time period without regard to the time horizon of impairments.

### ***Marginal Impairment Rate***

For a cohort of securities outstanding (or issued if by original rating) at the beginning of year  $t$ , the  $N$ -th year marginal impairment rate is the number of securities newly impaired in year  $(t+N)$  divided by the total number of securities that survived to that year. Securities that are impaired or withdrawn before the year have not survived, and therefore do not appear in the denominator of this rate.

### ***Marginal Cure Rate***

For a cohort of securities that experienced payment defaults in year  $t$ , the  $N$ -th year marginal cure rate measures the number of payment defaults cured in year  $(t+N)$  (measured in calendar years, not in actual number of months), as a share of all payment defaults occurred in year  $t$ .

### ***Loss Severity or LGD***

The LGD rate of an impaired structured finance security is measured by the sum of the present values of net losses, including both interest shortfalls and principal losses, discounted by the security's coupon rate and expressed as a percentage of a given principal balance such as the principal balance at origination, at impairment date, or any given cohort date.

### ***Matured and Non-Matured Defaults***

Securities that have sustained payment defaults are called "matured defaults" if their principal balance has been reduced to zero. They are called "non-matured defaults" if they have positive principal balance outstanding as of the end of the study period.

### ***Multi-Year Cumulative Loss Rate***

This is the product of the multi-year cumulative impairment rate and multi-year average LGD rate. The multi-year average LGD rate is estimated using the realized and estimated final LGD rates of impaired securities that have known loss rates, after taking into account the uncertainty of impairment timing.

### ***ABS***

ABS stand for asset-backed securities. This structured finance sector includes securities backed by home equity loans (HEL) and both traditional asset types such as auto loans, credit card receivables, student loans, and manufactured housing loans, and non-traditional asset types such as mutual fund fees, tax liens, tobacco settlement payments, and intellectual property.

### ***HEL***

The home equity loan or HEL sector includes securities backed by subprime (B&C) mortgage loans, home improvement loans, high loan-to-value (high LTV) loans, home equity lines of credit (HELOCs), and closed-end second-lien loans, as well as net interest margin (NIM) securitizations. It does not include securities backed by Alt-A mortgages, which are included in the RMBS sector. HEL is part of the ABS sector.

### ***CDOs***

CDOs stand for collateralized debt obligations. Derivative securities such as structured notes, repackaged securities, and credit derivatives are not considered to be part of this sector.

### ***CMBS***

CMBS stand for commercial mortgage-backed securities.

### ***RMBS***

RMBS stand for residential mortgage-backed securities. The large majority of these securities are backed by first-lien prime mortgages, but some are backed by Alt-A mortgages. HEL is not considered to be part of this sector.



***All Structured Finance***

All structured finance captures global structured securities in four major sectors: ABS, CDO, CMBS, and RMBS.

***U.S. Structured Finance***

U.S. structured finance securities are denominated in U.S. dollars and issued in the U.S. market.

***European Structured Finance***

European structured finance securities are denominated in a European currency or issued in a European country.

***Structured Finance in Other Regions***

Structured finance securities in other regions are non-U.S. and non-European securities.

## Appendix 2: How to Calculate Multi-Year Material Impairment Rate and LGD Rate

### CUMULATIVE IMPAIRMENT RATE BY COHORT RATING

Moody's uses the same method to calculate multi-year cumulative impairment rates as that used in Moody's corporate issuer default studies. In particular, we make an adjustment to the denominator of a marginal impairment rate in a given period (such as a year) to reflect tranches whose ratings were withdrawn or impaired prior to that period. Such adjustment ensures future impairments can only occur to survived tranches, i.e. withdrawn tranches or impaired tranches are not eligible for impairments in the subsequent periods.

The cumulative impairment rate for a time horizon  $T$  is therefore calculated as:

$$D(T) = 1 - \prod_{t=1}^T (1 - d_t)$$

Where  $d_t$  is the marginal impairment rate:

$$d_t = \frac{x_t}{n_t - w_t / 2}$$

Where  $x_t$  is the number of impairments in year  $t$ ,  $w_t$  is the number of rating withdrawals in year  $t$ , and

$$n_t = n_{t-1} - x_{t-1} - w_{t-1}$$

which is the number of tranches that survived into the cohort at time  $t$ . When the time horizon  $T$  is equal to 1, the cumulative impairment rate and the marginal impairment rate are equal. Note that in addition to removing the prior-year withdrawals from the denominator, half of the withdrawals in time  $t$  are also removed. This is because we use discrete data to estimate marginal impairment rate and the timing of withdrawals within a given period is assumed to be uniformly distributed.

Let us now look at an example, assuming all securities are carrying the same rating in both 2004 and 2005.

| An Example for Calculating a Two-Year Cumulative Impairment Rate |                    |           |                                  |                    |           |
|--|--------------------|-----------|----------------------------------|--------------------|-----------|
| 2004   |                    |           | 2005                             |                    |           |
| At the beginning of 2004   | At the end of 2004 |           | At the beginning of 2005         | At the end of 2005 |           |
| Number of Securities Issued                                      | Impaired           | Withdrawn | Number of Securities Outstanding | Impaired           | Withdrawn |
| 200  | 10                 | 95        | 95                               | 5                  | 90        |

In the example, the average first-year marginal impairment rate is  $(10+5)/(200+95-95/2-90/2)$ , or 7.41%. The second-year marginal impairment rate is  $5/(95-90/2)=10\%$ .<sup>14</sup> The average marginal survival rates are 92.6% and 90.0% in the first and second year, respectively. The average two-year cumulative survival rate is  $92.6\%*90.0\%=83.3\%$ . Therefore, the average two-year cumulative impairment rate is 16.7%.

We believe our method of calculating cumulative impairment rates provides the most relevant information to investors who want to look at the historical impairment experience when evaluating the risk of an investment with any particular expected maturity. There are, however, at least two other approaches found in the literature, which tend to produce lower impairment rates and/or fail to use all available information.

One approach, which is similar to the above method, calculates marginal impairment rates first, but it does not adjust for withdrawals, hence,  $n_t = n_{t-1} - x_{t-1}$ . As a result, the second year marginal impairment rate is  $5/(95+95-90/2)=3.45\%$ . The two-year cumulative impairment rate becomes  $(1-7.41\%)*(1-3.45\%) = 10.6\%$ .

Another approach calculates cumulative impairment rates using a ratings transition matrix, treating impairment as a "rating" category (we note that Moody's does not have a "D" or default rating category). For a given time horizon, ratings transition frequencies are calculated using only ratings observations at the beginning and the end of the time horizon. Newly issued ratings that have not spanned the entire time horizon are not included. For example, if

14. There are two first-year cohorts in this example - one formed at the beginning of 2004 and the other formed at the beginning of 2005. However, there is only one second-year cohort - the observations in 2005 of the two-year cohort that is formed at the beginning of 2004.

additional securities are issued at the beginning of 2005, the impairment experience of those securities would not be included in a two-year impairment rate calculation. Therefore this latter approach does not fully utilize all available data.

## CUMULATIVE IMPAIRMENT RATE BY ORIGINAL RATING

As in previous structured finance default studies, we calculate impairment rates for both cohort and original ratings using essentially the same method. We find that cumulative impairment rates by original rating have on average been lower than those by cohort rating for structured finance as a whole. We also caution that the contrast of the impairment rates by these two types of ratings can be different depending on sector and sample period. This can be best illustrated in the following example.

| <b>An Example Showing the Difference between Cohort-Based Impairment Rates and Origination-Based Impairment Rates</b> |                    |           |   |                    |           |
|---|--------------------|-----------|---|--------------------|-----------|
| 2004  |                    |           | 2005  |                    |           |
| At the beginning of 2004  | At the end of 2004 |           | At the beginning of 2005  | At the end of 2005 |           |
| Number of Securities Issued and Their Rating  | Impaired           | Withdrawn | Distribution of Outstanding Securities by Rating                | Impaired           | Withdrawn |
| 100, rated <b>Baa</b>   | 0                  | 0         | 95, remain <b>Baa</b> rated<br>5, downgraded to <b>single-B</b> | 0                  | 95        |
| 100, rated <b>single-B</b>  | 0                  | 0         | 100, remain <b>single-B</b>                                     | 5                  | 95        |

In the example, 100 Baa-rated and 100 single-B rated securities are issued at the beginning of 2004. 95 of the 100 Baa-rated securities have not changed their ratings and are withdrawn at the end of 2005, but five of them are downgraded to single-B in 2004 before they become impaired in 2005. Five of the 100 single-B rated securities issued in 2004 become impaired in 2005 and the rest (95 securities) are withdrawn in 2005.

Based on cohort ratings, the first-year marginal impairment rate in the Baa category is 0% since no impairments are observed on securities rated Baa in 2004 or 2005. The second year marginal impairment rate for Baa is  $5/(100-95/2)=9.5\%$  (this is based solely on the performance in 2005 of the 100 Baa-rated securities issued in 2004). Hence, the two-year cumulative impairment rate in the Baa rating category is 9.5%.

By original rating, the two-year cumulative impairment rate for the Baa rating category is also 9.5% because the Baa sample and performance are the same whether they are by original rating or cohort rating. In the single-B category, however, there are significant differences.

For the single-B rating category, the average first-year marginal impairment rate by cohort rating is  $(0+5+5)/(100+100+5-95/2)=6.35\%$ . Note that there are three first-year cohorts for single-B, and both the numerator and denominator include five single-B securities at the beginning of 2005 that are initially rated Baa at the beginning of 2004. The second-year marginal impairment rate by cohort rating is  $5/(100-95/2)=9.5\%$ . Therefore, the average two-year cumulative impairment rate is  $1-(1-6.35\%)*(1-9.5\%)=15.25\%$ .

However, by original rating, the first-year single-B marginal impairment rate is 0% because the only first-year in the example for single-B is 2004 and there are no impairments. The second-year marginal impairment rate is 9.5%, the same as that by cohort rating. This implies that the two-year cumulative impairment rate by original rating for single-B is 9.5%, which is substantially lower than the cumulative impairment rate of 15.25% by cohort rating.

The large difference illustrated above for single-B original-rating two-year impairment rates hinges on the treatment of the five securities initially rated Baa at the beginning of 2004 but are rated single-B at the beginning of 2005. These securities are not originally rated single-B, but are downgraded to that rating. If the performance of these downgraded single-B's is worse than the original single-B's, then the cohort-rating based impairment rates will be higher than the original-rating based impairment rates. Conversely, if the performance of these downgraded single-B's is better, the cohort-rating based impairment rates will be lower instead.

## MULTI-YEAR CUMULATIVE LGD RATES

The concept of multi-year cumulative LGD rate<sup>15</sup> is necessary when loss rates on all impaired securities are not available, so a direct calculation of cumulative loss rate is not possible. The method can best be explained by an example. Suppose we know the average loss severity (as a percent of the cohort-date balance) of securities that were rated single-B two years before they defaulted and those rated single-B one year before they defaulted. We will call these loss severity values "marginal loss severity rates." To calculate the average loss severity rates of the single-B rated securities that defaulted within two years (either in year one or year two) one needs to take a weighted average of the one-year and the two-year marginal severity rates, where the weights are the shares of the two-year cumulative default rates attributable to year one and year two. The following is a concrete example.

| An Example for Calculating a Two-Year Cumulative LGD Rate |                    |           |                                  |                    |           |
|---|--------------------|-----------|----------------------------------|--------------------|-----------|
| 2004  |                    |           | 2005                             |                    |           |
| At the beginning of 2004                                  | At the end of 2004 |           | At the beginning of 2005         | At the end of 2005 |           |
| Number of Securities Issued                               | Impaired           | Withdrawn | Number of Outstanding Securities | Impaired           | Withdrawn |
| 100   | 5 (LGD=30%)        | 0         | 95                               | 6 (LGD=50%)        | 89        |

In this example, there are five impairments in the first year, and all have a loss severity rate of 30% as a share of their balance at the beginning of 2004. Six securities are impaired in the second year, and all have a loss severity rate of 50%, which is expressed as a share of the principal balance at the beginning of 2004 – the two-year cohort-date balance. Note that in order to compute a two-year cumulative LGD rate, all marginal LGD rates need to be expressed as a share of the cohort-date balance with appropriate discounting.

In the example, the one-year impairment rate is 5%, and the two-year cumulative impairment rate is  $1 - (1 - 5\%) * (1 - 6 / (95 - 89 / 2))$ , or 16.3%. The two-year cumulative LGD rate is:  $(5\% * 30\% + 11.3\% * 50\%) / 16.3\% = 43.9\%$ , which measures the average LGD rate over a two-year period, assuming no knowledge about the timing of impairments at the beginning of 2004.

The two-year cumulative loss rate is the product of the two-year cumulative impairment rate and the two-year cumulative LGD rate, i.e.  $16.3\% * 43.9\% = 7.2\%$ .

Finally, our estimated average multi-year LGD rates can be directly computed from the tables in Appendices 3 and 4 by simply dividing the estimated multi-year loss rates by the multi-year impairment rates.

In addition, the multi-year LGD rates for RMBS, HEL, RMBS/HEL combined, and CMBS are empirically estimated based on a sample of matured and non-matured impaired RMBS and HEL tranches during 1987-2005. The multi-year LGD rates for CDOs are empirically estimated based on a sample of matured and non-matured impaired CDO tranches during 1993-2005. The multi-year LGD rates for all structured finance as a whole, ABS overall, and ABS excluding MH and HEL are the equally-weighted averages of multi-year LGD rates for RMBS/HEL and CDOs. LGD rates at longer horizons are subject to small sample variations.

<sup>15</sup> When analyzing loss severity given default, we use the term LGD (loss given default) instead of LGI (loss given impairment) because LGD is a commonly used term, and the data sample is made up of only uncured payment defaults and an impaired security is also in payment default.

## Appendix 3: Impairment Rates by Rating

**Figure 37 – Multi-Year Cumulative Impairment Rates by Cohort Rating, 1993-2005**

|                               | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year |
|-------------------------------|--------|--------|--------|--------|--------|
| <b>All Structured Finance</b> |        |        |        |        |        |
| Aaa                           | 0.02%  | 0.07%  | 0.17%  | 0.30%  | 0.40%  |
| Aa                            | 0.18%  | 0.53%  | 1.18%  | 2.00%  | 2.63%  |
| A                             | 0.24%  | 0.95%  | 1.79%  | 2.63%  | 3.35%  |
| Baa                           | 1.19%  | 3.49%  | 6.79%  | 9.66%  | 12.94% |
| Ba                            | 3.79%  | 8.75%  | 12.94% | 17.10% | 19.45% |
| B                             | 5.94%  | 11.85% | 17.89% | 22.68% | 26.54% |
| Caa                           | 25.73% | 37.41% | 44.11% | 55.57% | 63.77% |
| Investment Grade              | 0.37%  | 1.13%  | 2.21%  | 3.25%  | 4.30%  |
| Speculative Grade             | 5.55%  | 11.07% | 15.93% | 20.46% | 23.48% |
| All Ratings                   | 0.99%  | 2.33%  | 3.88%  | 5.34%  | 6.64%  |
| <b>US ABS</b>                 |        |        |        |        |        |
| Aaa                           | 0.05%  | 0.11%  | 0.26%  | 0.38%  | 0.53%  |
| Aa                            | 0.50%  | 1.42%  | 2.98%  | 4.85%  | 6.43%  |
| A                             | 0.27%  | 1.26%  | 2.58%  | 3.94%  | 5.27%  |
| Baa                           | 1.42%  | 4.51%  | 9.73%  | 14.76% | 21.93% |
| Ba                            | 9.93%  | 22.88% | 32.08% | 45.07% | 50.81% |
| B                             | 17.70% | 31.30% | 42.03% | 47.96% | 53.16% |
| Caa                           | 41.94% | 58.53% | 58.53% | n/a    | n/a    |
| Investment Grade              | 0.48%  | 1.55%  | 3.23%  | 4.93%  | 7.07%  |
| Speculative Grade             | 14.20% | 27.33% | 36.43% | 47.40% | 52.84% |
| All Ratings                   | 1.33%  | 3.13%  | 5.25%  | 7.55%  | 9.91%  |
| <b>US CMBS</b>                |        |        |        |        |        |
| Aaa                           | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| Aa                            | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| A                             | 0.04%  | 0.15%  | 0.31%  | 0.31%  | 0.31%  |
| Baa                           | 0.27%  | 0.66%  | 0.83%  | 0.91%  | 1.05%  |
| Ba                            | 0.58%  | 1.47%  | 2.71%  | 3.39%  | 4.28%  |
| B                             | 2.36%  | 6.14%  | 11.45% | 17.47% | 23.45% |
| Caa                           | 15.79% | 28.56% | 40.56% | 56.20% | 67.73% |
| Investment Grade              | 0.11%  | 0.27%  | 0.37%  | 0.40%  | 0.45%  |
| Speculative Grade             | 2.08%  | 4.80%  | 8.44%  | 12.45% | 16.50% |
| All Ratings                   | 0.66%  | 1.55%  | 2.64%  | 3.76%  | 4.86%  |
| <b>US RMBS</b>                |        |        |        |        |        |
| Aaa                           | 0.00%  | 0.07%  | 0.22%  | 0.42%  | 0.53%  |
| Aa                            | 0.02%  | 0.09%  | 0.24%  | 0.43%  | 0.48%  |
| A                             | 0.26%  | 0.72%  | 0.97%  | 1.03%  | 1.12%  |
| Baa                           | 0.92%  | 2.47%  | 4.40%  | 5.94%  | 7.06%  |
| Ba                            | 2.13%  | 4.46%  | 6.69%  | 8.22%  | 9.38%  |
| B                             | 3.42%  | 6.74%  | 9.93%  | 11.37% | 12.17% |
| Caa                           | 27.59% | 37.75% | 43.54% | 50.38% | 54.70% |
| Investment Grade              | 0.21%  | 0.62%  | 1.14%  | 1.58%  | 1.88%  |
| Speculative Grade             | 2.92%  | 5.72%  | 8.34%  | 9.95%  | 11.05% |
| All Ratings                   | 0.54%  | 1.25%  | 2.03%  | 2.63%  | 3.03%  |

**Figure 37 – Multi-Year Cumulative Impairment Rates by Cohort Rating, 1993-2005**

|                                       | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year |
|---------------------------------------|--------|--------|--------|--------|--------|
| <b>US ABS (excl. both MH and HEL)</b> |        |        |        |        |        |
| Aaa                                   | 0.08%  | 0.16%  | 0.30%  | 0.41%  | 0.59%  |
| Aa                                    | 0.89%  | 2.01%  | 3.80%  | 5.90%  | 8.23%  |
| A                                     | 0.13%  | 0.67%  | 1.49%  | 2.47%  | 3.31%  |
| Baa                                   | 0.83%  | 2.94%  | 6.08%  | 9.07%  | 11.78% |
| Ba                                    | 4.95%  | 15.12% | 22.99% | 29.62% | 34.98% |
| B                                     | 20.11% | 34.93% | 40.72% | 40.72% | 40.72% |
| Caa                                   | 39.18% | 52.51% | 52.51% | n/a    | n/a    |
| Investment Grade                      | 0.25%  | 0.81%  | 1.63%  | 2.50%  | 3.34%  |
| Speculative Grade                     | 12.82% | 24.16% | 30.85% | 35.77% | 39.73% |
| All Ratings                           | 0.85%  | 1.86%  | 2.88%  | 3.86%  | 4.77%  |
| <b>US RMBS &amp; HEL</b>              |        |        |        |        |        |
| Aaa                                   | 0.00%  | 0.05%  | 0.17%  | 0.35%  | 0.44%  |
| Aa                                    | 0.01%  | 0.06%  | 0.17%  | 0.32%  | 0.35%  |
| A                                     | 0.15%  | 0.52%  | 0.93%  | 1.23%  | 1.46%  |
| Baa                                   | 0.79%  | 2.31%  | 4.52%  | 6.82%  | 8.63%  |
| Ba                                    | 2.59%  | 6.04%  | 9.59%  | 12.07% | 14.24% |
| B                                     | 4.88%  | 9.60%  | 14.50% | 17.45% | 19.57% |
| Caa                                   | 40.00% | 52.17% | 56.43% | 61.71% | 65.04% |
| Investment Grade                      | 0.21%  | 0.64%  | 1.27%  | 1.92%  | 2.40%  |
| Speculative Grade                     | 3.91%  | 7.94%  | 11.95% | 14.64% | 16.82% |
| All Ratings                           | 0.58%  | 1.40%  | 2.43%  | 3.33%  | 4.04%  |
| <b>US HEL</b>                         |        |        |        |        |        |
| Aaa                                   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| Aa                                    | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| A                                     | 0.05%  | 0.31%  | 0.95%  | 1.66%  | 2.23%  |
| Baa                                   | 0.66%  | 2.14%  | 4.86%  | 8.94%  | 12.87% |
| Ba                                    | 3.83%  | 10.90% | 18.81% | 24.74% | 31.58% |
| B                                     | 12.21% | 23.41% | 35.14% | 43.49% | 50.37% |
| Caa                                   | 62.50% | 81.25% | 81.25% | n/a    | n/a    |
| Investment Grade                      | 0.21%  | 0.69%  | 1.58%  | 2.85%  | 4.08%  |
| Speculative Grade                     | 7.09%  | 15.57% | 24.50% | 31.20% | 38.09% |
| All Ratings                           | 0.64%  | 1.70%  | 3.34%  | 5.23%  | 7.18%  |
| <b>Global CDOs</b>                    |        |        |        |        |        |
| Aaa                                   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| Aa                                    | 0.10%  | 0.31%  | 1.10%  | 2.55%  | 4.08%  |
| A                                     | 0.57%  | 1.80%  | 3.33%  | 5.59%  | 6.66%  |
| Baa                                   | 2.59%  | 7.52%  | 14.16% | 19.67% | 24.02% |
| Ba                                    | 4.84%  | 11.71% | 18.23% | 21.75% | 25.29% |
| B                                     | 12.49% | 24.64% | 36.75% | 46.48% | 52.78% |
| Caa                                   | 21.80% | 31.25% | 31.25% | 31.25% | n/a    |
| Investment Grade                      | 0.86%  | 2.59%  | 5.10%  | 7.56%  | 9.57%  |
| Speculative Grade                     | 7.80%  | 16.05% | 23.72% | 28.94% | 33.58% |
| All Ratings                           | 2.01%  | 4.87%  | 8.28%  | 11.20% | 13.62% |

**Figure 37 – Multi-Year Cumulative Impairment Rates by Cohort Rating, 1993-2005**

|   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year |
|---|--------|--------|--------|--------|--------|
| <b>Global CDOs excl. HYCBOS</b>                         |        |        |        |        |        |
| Aaa   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| Aa  | 0.12%  | 0.32%  | 0.80%  | 1.52%  | 1.52%  |
| A   | 0.43%  | 1.14%  | 2.05%  | 3.20%  | 3.20%  |
| Baa   | 1.34%  | 4.21%  | 7.99%  | 11.12% | 12.82% |
| Ba  | 2.05%  | 5.26%  | 8.72%  | 11.44% | 14.11% |
| B   | 7.15%  | 13.53% | 19.68% | 24.34% | 30.23% |
| Caa   | 17.47% | 26.15% | 26.15% | 26.15% | n/a    |
| Investment Grade  | 0.47%  | 1.45%  | 2.85%  | 4.21%  | 4.81%  |
| Speculative Grade                                       | 4.02%  | 8.13%  | 12.08% | 15.24% | 18.93% |
| All Ratings   | 0.98%  | 2.43%  | 4.22%  | 5.87%  | 6.97%  |
| <b>European Structured Finance (excl. CDOs)</b>         |        |        |        |        |        |
| Aaa   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| Aa  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| A   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| Baa   | 0.08%  | 0.19%  | 0.19%  | 0.19%  | 0.19%  |
| Ba  | 0.00%  | 0.44%  | 1.16%  | 1.16%  | 1.16%  |
| B   | 4.00%  | 4.00%  | 4.00%  | n/a    | n/a    |
| Caa   | 0.00%  | 0.00%  | n/a    | n/a    | n/a    |
| Investment Grade  | 0.01%  | 0.03%  | 0.03%  | 0.03%  | 0.03%  |
| Speculative Grade                                       | 0.26%  | 0.67%  | 1.38%  | 1.38%  | 1.38%  |
| All Ratings   | 0.03%  | 0.06%  | 0.09%  | 0.09%  | 0.09%  |
| <b>Structured Finance in Other Regions (excl. CDOs)</b> |        |        |        |        |        |
| Aaa   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| Aa  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| A   | 0.00%  | 0.24%  | 0.24%  | 0.24%  | 0.24%  |
| Baa   | 0.28%  | 0.28%  | 0.28%  | 0.28%  | 0.28%  |
| Ba  | 0.00%  | 0.71%  | 2.02%  | 4.66%  | 10.62% |
| B   | 1.06%  | 1.06%  | 1.06%  | 1.06%  | 1.06%  |
| Caa   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| Investment Grade  | 0.05%  | 0.09%  | 0.09%  | 0.09%  | 0.09%  |
| Speculative Grade                                       | 0.29%  | 0.79%  | 1.77%  | 3.74%  | 7.92%  |
| All Ratings   | 0.07%  | 0.14%  | 0.21%  | 0.33%  | 0.58%  |

**Figure 38 – Multi-Year Cumulative Impairment Rates by Original Rating, 1993-2005**

|                               | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year  |
|-------------------------------|--------|--------|--------|--------|--------|--------|---------|
| <b>All Structured Finance</b> |        |        |        |        |        |        |         |
| Aaa                           | 0.02%  | 0.08%  | 0.12%  | 0.30%  | 0.73%  | 0.84%  | 0.92%   |
| Aa                            | 0.05%  | 0.34%  | 0.63%  | 1.74%  | 3.22%  | 4.05%  | 4.58%   |
| A                             | 0.04%  | 0.31%  | 1.05%  | 2.33%  | 3.46%  | 4.25%  | 4.83%   |
| Baa                           | 0.04%  | 0.69%  | 3.39%  | 7.83%  | 10.99% | 14.41% | 16.77%  |
| Ba                            | 0.16%  | 2.37%  | 6.23%  | 12.48% | 16.22% | 18.88% | 20.30%  |
| B                             | 0.17%  | 1.47%  | 8.77%  | 16.36% | 22.59% | 26.56% | 30.38%  |
| Caa                           | 2.47%  | 2.47%  | 6.08%  | 14.82% | 29.85% | 48.15% | 74.08%  |
| Investment Grade              | 0.03%  | 0.33%  | 1.19%  | 2.78%  | 4.20%  | 5.38%  | 6.21%   |
| Speculative Grade             | 0.19%  | 2.08%  | 7.04%  | 13.76% | 18.56% | 22.02% | 24.43%  |
| All Ratings                   | 0.05%  | 0.52%  | 1.87%  | 4.07%  | 5.91%  | 7.37%  | 8.39%   |
| <b>US ABS</b>                 |        |        |        |        |        |        |         |
| Aaa                           | 0.05%  | 0.22%  | 0.31%  | 0.66%  | 1.10%  | 1.22%  | 1.42%   |
| Aa                            | 0.14%  | 1.07%  | 1.96%  | 3.93%  | 7.76%  | 9.96%  | 11.44%  |
| A                             | 0.03%  | 0.30%  | 1.22%  | 3.11%  | 4.94%  | 6.13%  | 7.29%   |
| Baa                           | 0.03%  | 0.66%  | 3.43%  | 7.94%  | 12.90% | 19.59% | 25.70%  |
| Ba                            | 0.57%  | 7.65%  | 17.72% | 28.80% | 40.08% | 45.97% | 51.81%  |
| B                             | 0.00%  | 3.13%  | 27.34% | 44.78% | 44.78% | 57.93% | 61.59%  |
| Caa                           | 50.00% | 50.00% | 50.00% | 50.00% | 50.00% | 50.00% | n/a     |
| Investment Grade              | 0.06%  | 0.48%  | 1.47%  | 3.31%  | 5.55%  | 7.65%  | 9.60%   |
| Speculative Grade             | 0.66%  | 7.06%  | 19.58% | 31.98% | 40.58% | 48.51% | 53.82%  |
| All Ratings                   | 0.08%  | 0.75%  | 2.30%  | 4.65%  | 7.24%  | 9.68%  | 11.84%  |
| <b>US CMBS</b>                |        |        |        |        |        |        |         |
| Aaa                           | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%   |
| Aa                            | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%   |
| A                             | 0.00%  | 0.00%  | 0.42%  | 0.42%  | 0.42%  | 0.42%  | 0.42%   |
| Baa                           | 0.00%  | 0.41%  | 1.54%  | 1.54%  | 1.54%  | 1.54%  | 1.54%   |
| Ba                            | 0.00%  | 0.39%  | 0.39%  | 2.57%  | 2.57%  | 2.57%  | 2.57%   |
| B                             | 0.18%  | 0.40%  | 2.95%  | 7.27%  | 15.70% | 18.48% | 25.73%  |
| Caa                           | 0.00%  | 0.00%  | 4.35%  | 14.69% | 32.97% | 55.31% | 100.00% |
| Investment Grade              | 0.00%  | 0.16%  | 0.69%  | 0.69%  | 0.69%  | 0.69%  | 0.69%   |
| Speculative Grade             | 0.08%  | 0.38%  | 1.68%  | 5.14%  | 9.95%  | 12.60% | 16.92%  |
| All Ratings                   | 0.02%  | 0.22%  | 0.98%  | 1.97%  | 3.35%  | 4.06%  | 5.03%   |
| <b>US RMBS</b>                |        |        |        |        |        |        |         |
| Aaa                           | 0.00%  | 0.00%  | 0.00%  | 0.12%  | 1.03%  | 1.20%  | 1.20%   |
| Aa                            | 0.00%  | 0.00%  | 0.00%  | 1.23%  | 1.41%  | 1.41%  | 1.41%   |
| A                             | 0.00%  | 0.12%  | 0.82%  | 1.36%  | 1.36%  | 1.72%  | 1.72%   |
| Baa                           | 0.07%  | 0.62%  | 2.09%  | 7.53%  | 9.25%  | 10.03% | 10.30%  |
| Ba                            | 0.00%  | 0.21%  | 1.56%  | 5.90%  | 6.79%  | 8.22%  | 8.74%   |
| B                             | 0.26%  | 0.93%  | 8.35%  | 13.01% | 16.69% | 16.69% | 17.85%  |
| Caa                           | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%   |
| Investment Grade              | 0.01%  | 0.13%  | 0.54%  | 2.11%  | 2.84%  | 3.12%  | 3.18%   |
| Speculative Grade             | 0.10%  | 0.48%  | 4.07%  | 8.50%  | 10.29% | 11.25% | 11.96%  |
| All Ratings                   | 0.02%  | 0.18%  | 1.04%  | 3.02%  | 3.90%  | 4.29%  | 4.44%   |



**Figure 38 – Multi-Year Cumulative Impairment Rates by Original Rating, 1993-2005**

|                                       | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
|---------------------------------------|--------|--------|--------|--------|--------|--------|--------|
| <b>US ABS (excl. both MH and HEL)</b> |        |        |        |        |        |        |        |
| Aaa                                   | 0.10%  | 0.38%  | 0.51%  | 0.93%  | 1.31%  | 1.50%  | 1.80%  |
| Aa                                    | 0.72%  | 3.33%  | 4.74%  | 7.09%  | 11.16% | 16.29% | 16.29% |
| A                                     | 0.06%  | 0.33%  | 1.03%  | 2.22%  | 3.50%  | 3.92%  | 4.25%  |
| Baa                                   | 0.16%  | 0.97%  | 4.41%  | 7.47%  | 9.16%  | 11.03% | 11.03% |
| Ba                                    | 0.58%  | 5.65%  | 15.87% | 26.78% | 33.05% | 36.58% | 44.50% |
| B                                     | 0.00%  | 5.00%  | 46.56% | 54.78% | 54.78% | 54.78% | 54.78% |
| Caa                                   | 50.00% | 50.00% | 50.00% | 50.00% | 50.00% | 50.00% | n/a    |
| Investment Grade                      | 0.15%  | 0.69%  | 1.51%  | 2.66%  | 3.80%  | 4.64%  | 4.90%  |
| Speculative Grade                     | 1.01%  | 6.01%  | 20.28% | 30.65% | 35.92% | 38.77% | 44.89% |
| All Ratings                           | 0.19%  | 0.89%  | 2.18%  | 3.59%  | 4.85%  | 5.74%  | 6.12%  |
| <b>US RMBS &amp; HEL</b>              |        |        |        |        |        |        |        |
| Aaa                                   | 0.00%  | 0.00%  | 0.00%  | 0.08%  | 0.78%  | 0.91%  | 0.91%  |
| Aa                                    | 0.00%  | 0.00%  | 0.00%  | 0.80%  | 0.93%  | 0.93%  | 0.93%  |
| A                                     | 0.00%  | 0.11%  | 0.54%  | 1.08%  | 1.65%  | 1.87%  | 2.42%  |
| Baa                                   | 0.03%  | 0.29%  | 1.35%  | 5.81%  | 8.59%  | 10.72% | 11.57% |
| Ba                                    | 0.00%  | 0.48%  | 2.35%  | 7.65%  | 10.81% | 13.14% | 14.02% |
| B                                     | 0.24%  | 1.11%  | 9.37%  | 17.88% | 20.73% | 24.71% | 26.56% |
| Caa                                   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| Investment Grade                      | 0.01%  | 0.09%  | 0.42%  | 1.77%  | 2.76%  | 3.34%  | 3.64%  |
| Speculative Grade                     | 0.07%  | 0.70%  | 4.76%  | 11.09% | 14.14% | 17.00% | 18.18% |
| All Ratings                           | 0.01%  | 0.15%  | 0.90%  | 2.83%  | 4.10%  | 5.00%  | 5.42%  |
| <b>US HEL</b>                         |        |        |        |        |        |        |        |
| Aaa                                   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| Aa                                    | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| A                                     | 0.00%  | 0.10%  | 0.27%  | 0.81%  | 2.09%  | 2.09%  | 3.94%  |
| Baa                                   | 0.00%  | 0.08%  | 0.69%  | 3.90%  | 8.40%  | 13.44% | 16.06% |
| Ba                                    | 0.00%  | 1.45%  | 4.97%  | 13.09% | 24.79% | 31.62% | 34.73% |
| B                                     | 0.00%  | 2.38%  | 15.23% | 37.10% | 37.10% | 54.57% | 59.36% |
| Caa                                   | n/a    | n/a    | n/a    | n/a    | n/a    | n/a    | n/a    |
| Investment Grade                      | 0.00%  | 0.05%  | 0.26%  | 1.24%  | 2.79%  | 4.22%  | 5.45%  |
| Speculative Grade                     | 0.00%  | 1.67%  | 7.57%  | 19.84% | 27.53% | 38.90% | 42.77% |
| All Ratings                           | 0.00%  | 0.11%  | 0.68%  | 2.54%  | 4.67%  | 7.12%  | 8.66%  |
| <b>Global CDOs</b>                    |        |        |        |        |        |        |        |
| Aaa                                   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| Aa                                    | 0.00%  | 0.00%  | 0.00%  | 0.58%  | 2.08%  | 3.70%  | 5.12%  |
| A                                     | 0.10%  | 0.87%  | 2.01%  | 4.42%  | 6.80%  | 8.99%  | 8.99%  |
| Baa                                   | 0.08%  | 1.55%  | 7.95%  | 17.94% | 23.87% | 29.98% | 31.28% |
| Ba                                    | 0.19%  | 3.97%  | 11.19% | 21.42% | 28.08% | 34.52% | 34.52% |
| B                                     | 0.00%  | 8.75%  | 26.46% | 44.84% | 53.46% | 60.81% | 67.34% |
| Caa                                   | 0.00%  | n/a    | n/a    | n/a    | n/a    | n/a    | n/a    |
| Investment Grade                      | 0.04%  | 0.59%  | 2.67%  | 6.26%  | 8.90%  | 11.70% | 12.73% |
| Speculative Grade                     | 0.16%  | 4.73%  | 13.80% | 25.83% | 33.45% | 41.06% | 44.74% |
| All Ratings                           | 0.06%  | 1.09%  | 4.15%  | 9.13%  | 12.60% | 16.15% | 17.50% |

**Figure 38 – Multi-Year Cumulative Impairment Rates by Original Rating, 1993-2005**

|   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
|---|--------|--------|--------|--------|--------|--------|--------|
| <b>Global CDOs excl. HYCBOS</b>                         |        |        |        |        |        |        |        |
| Aaa   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| Aa  | 0.00%  | 0.00%  | 0.00%  | 0.79%  | 2.39%  | 2.39%  | 2.39%  |
| A   | 0.10%  | 0.52%  | 1.36%  | 2.98%  | 3.97%  | 3.97%  | 3.97%  |
| Baa   | 0.10%  | 1.26%  | 5.57%  | 10.92% | 13.12% | 13.12% | 13.12% |
| Ba  | 0.24%  | 1.81%  | 5.07%  | 10.80% | 15.86% | 22.46% | 22.46% |
| B   | 0.00%  | 5.13%  | 5.13%  | 14.94% | 14.94% | 31.95% | 31.95% |
| Caa   | 0.00%  | n/a    | n/a    | n/a    | n/a    | n/a    | n/a    |
| Investment Grade  | 0.05%  | 0.42%  | 1.75%  | 3.72%  | 4.94%  | 4.94%  | 4.94%  |
| Speculative Grade                                       | 0.22%  | 2.18%  | 5.04%  | 11.44% | 15.27% | 25.73% | 25.73% |
| All Ratings   | 0.06%  | 0.60%  | 2.11%  | 4.69%  | 6.31%  | 8.06%  | 8.06%  |
| <b>European Structured Finance (excl. CDOs)</b>         |        |        |        |        |        |        |        |
| Aaa   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| Aa  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| A   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| Baa   | 0.00%  | 0.00%  | 0.41%  | 0.41%  | 0.41%  | 0.41%  | 0.41%  |
| Ba  | 0.00%  | 0.00%  | 0.00%  | 2.47%  | 2.47%  | 2.47%  | 2.47%  |
| B   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | n/a    | n/a    |
| Caa   | 0.00%  | 0.00%  | n/a    | n/a    | n/a    | n/a    | n/a    |
| Investment Grade  | 0.00%  | 0.00%  | 0.07%  | 0.07%  | 0.07%  | 0.07%  | 0.07%  |
| Speculative Grade                                       | 0.00%  | 0.00%  | 0.00%  | 2.41%  | 2.41%  | 2.41%  | 2.41%  |
| All Ratings   | 0.00%  | 0.00%  | 0.07%  | 0.17%  | 0.17%  | 0.17%  | 0.17%  |
| <b>Structured Finance in Other Regions (excl. CDOs)</b> |        |        |        |        |        |        |        |
| Aaa   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| Aa  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| A   | 0.32%  | 0.80%  | 0.80%  | 0.80%  | 0.80%  | 0.80%  | 0.80%  |
| Baa   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| Ba  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 25.00% | 25.00% |
| B   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | n/a    |
| Caa   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | n/a    |
| Investment Grade  | 0.06%  | 0.14%  | 0.14%  | 0.14%  | 0.14%  | 0.14%  | 0.14%  |
| Speculative Grade                                       | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 14.29% | 14.29% |
| All Ratings   | 0.05%  | 0.13%  | 0.13%  | 0.13%  | 0.13%  | 1.09%  | 1.09%  |

## Appendix 4: Estimated Loss Rates by Rating

**Figure 39 – Estimated Multi-Year Cumulative Loss Rates by Cohort Rating, 1993-2005**

|                               | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year |
|-------------------------------|--------|--------|--------|--------|--------|
| <b>All Structured Finance</b> |        |        |        |        |        |
| Aaa                           | 0.00%  | 0.01%  | 0.01%  | 0.02%  | 0.02%  |
| Aa                            | 0.09%  | 0.27%  | 0.49%  | 0.75%  | 0.85%  |
| A                             | 0.14%  | 0.52%  | 0.96%  | 1.35%  | 1.40%  |
| Baa                           | 0.74%  | 2.16%  | 4.08%  | 5.53%  | 6.92%  |
| Ba                            | 2.57%  | 5.70%  | 8.29%  | 10.59% | 11.97% |
| B                             | 3.99%  | 8.13%  | 12.46% | 15.67% | 17.95% |
| Caa                           | 16.26% | 21.74% | 21.96% | 22.30% | 22.33% |
| Investment Grade              | 0.23%  | 0.68%  | 1.28%  | 1.76%  | 2.17%  |
| Speculative Grade             | 3.70%  | 7.32%  | 10.51% | 13.27% | 15.06% |
| All Ratings                   | 0.64%  | 1.48%  | 2.40%  | 3.14%  | 3.71%  |
| <b>US ABS</b>                 |        |        |        |        |        |
| Aaa                           | 0.00%  | 0.01%  | 0.02%  | 0.02%  | 0.03%  |
| Aa                            | 0.26%  | 0.71%  | 1.25%  | 1.84%  | 2.11%  |
| A                             | 0.16%  | 0.69%  | 1.37%  | 2.01%  | 2.10%  |
| Baa                           | 0.89%  | 2.79%  | 5.83%  | 8.36%  | 11.42% |
| Ba                            | 6.73%  | 14.92% | 20.59% | 27.79% | 31.16% |
| B                             | 11.88% | 21.43% | 29.10% | 33.08% | 36.16% |
| Caa                           | 26.51% | 34.30% | 34.30% | n/a    | n/a    |
| Investment Grade              | 0.30%  | 0.93%  | 1.86%  | 2.65%  | 3.47%  |
| Speculative Grade             | 9.48%  | 18.08% | 24.04% | 30.75% | 33.96% |
| All Ratings                   | 0.86%  | 1.99%  | 3.24%  | 4.41%  | 5.45%  |
| <b>US CMBS</b>                |        |        |        |        |        |
| Aaa                           | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| Aa                            | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| A                             | 0.01%  | 0.05%  | 0.09%  | 0.09%  | 0.09%  |
| Baa                           | 0.11%  | 0.26%  | 0.31%  | 0.33%  | 0.36%  |
| Ba                            | 0.26%  | 0.59%  | 0.99%  | 1.19%  | 1.40%  |
| B                             | 1.25%  | 3.31%  | 5.91%  | 7.97%  | 9.06%  |
| Caa                           | 8.97%  | 13.10% | 13.88% | 14.81% | 14.88% |
| Investment Grade              | 0.04%  | 0.10%  | 0.13%  | 0.13%  | 0.14%  |
| Speculative Grade             | 1.04%  | 2.24%  | 3.64%  | 4.83%  | 5.70%  |
| All Ratings                   | 0.30%  | 0.66%  | 1.02%  | 1.28%  | 1.46%  |
| <b>US RMBS</b>                |        |        |        |        |        |
| Aaa                           | 0.00%  | 0.01%  | 0.02%  | 0.03%  | 0.03%  |
| Aa                            | 0.00%  | 0.02%  | 0.03%  | 0.05%  | 0.06%  |
| A                             | 0.09%  | 0.25%  | 0.32%  | 0.33%  | 0.34%  |
| Baa                           | 0.36%  | 0.96%  | 1.59%  | 1.96%  | 2.17%  |
| Ba                            | 0.95%  | 1.81%  | 2.53%  | 2.98%  | 3.26%  |
| B                             | 1.82%  | 3.62%  | 5.18%  | 5.68%  | 5.82%  |
| Caa                           | 15.67% | 18.96% | 19.34% | 19.74% | 19.77% |
| Investment Grade              | 0.08%  | 0.23%  | 0.38%  | 0.46%  | 0.51%  |
| Speculative Grade             | 1.46%  | 2.69%  | 3.70%  | 4.18%  | 4.42%  |
| All Ratings                   | 0.25%  | 0.53%  | 0.79%  | 0.93%  | 1.00%  |

**Figure 39 – Estimated Multi-Year Cumulative Loss Rates by Cohort Rating, 1993-2005**

|                                       | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year |
|---------------------------------------|--------|--------|--------|--------|--------|
| <b>US ABS (excl. both MH and HEL)</b> |        |        |        |        |        |
| Aaa                                   | 0.00%  | 0.01%  | 0.02%  | 0.02%  | 0.03%  |
| Aa                                    | 0.46%  | 1.02%  | 1.63%  | 2.29%  | 2.69%  |
| A                                     | 0.07%  | 0.37%  | 0.79%  | 1.25%  | 1.31%  |
| Baa                                   | 0.52%  | 1.82%  | 3.65%  | 5.15%  | 6.31%  |
| Ba                                    | 3.36%  | 9.79%  | 14.64% | 18.31% | 21.46% |
| B                                     | 13.50% | 23.90% | 28.04% | 28.04% | 28.04% |
| Caa                                   | 24.76% | 31.02% | 31.02% | n/a    | n/a    |
| Investment Grade                      | 0.15%  | 0.49%  | 0.94%  | 1.35%  | 1.67%  |
| Speculative Grade                     | 8.56%  | 15.98% | 20.37% | 23.38% | 25.71% |
| All Ratings                           | 0.55%  | 1.18%  | 1.79%  | 2.29%  | 2.69%  |
| <b>US RMBS &amp; HEL</b>              |        |        |        |        |        |
| Aaa                                   | 0.00%  | 0.01%  | 0.01%  | 0.02%  | 0.02%  |
| Aa                                    | 0.00%  | 0.01%  | 0.02%  | 0.04%  | 0.04%  |
| A                                     | 0.05%  | 0.18%  | 0.29%  | 0.34%  | 0.37%  |
| Baa                                   | 0.31%  | 0.90%  | 1.62%  | 2.17%  | 2.50%  |
| Ba                                    | 1.16%  | 2.44%  | 3.58%  | 4.30%  | 4.82%  |
| B                                     | 2.59%  | 5.16%  | 7.56%  | 8.57%  | 8.96%  |
| Caa                                   | 22.72% | 26.66% | 26.94% | 27.25% | 27.27% |
| Investment Grade                      | 0.08%  | 0.24%  | 0.42%  | 0.54%  | 0.62%  |
| Speculative Grade                     | 1.96%  | 3.73%  | 5.28%  | 6.07%  | 6.54%  |
| All Ratings                           | 0.26%  | 0.60%  | 0.93%  | 1.14%  | 1.26%  |
| <b>US HEL</b>                         |        |        |        |        |        |
| Aaa                                   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| Aa                                    | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| A                                     | 0.02%  | 0.11%  | 0.28%  | 0.39%  | 0.47%  |
| Baa                                   | 0.26%  | 0.83%  | 1.71%  | 2.69%  | 3.42%  |
| Ba                                    | 1.71%  | 4.33%  | 6.88%  | 8.60%  | 10.25% |
| B                                     | 6.49%  | 12.57% | 18.33% | 21.18% | 22.44% |
| Caa                                   | 35.51% | 41.57% | 41.57% | n/a    | n/a    |
| Investment Grade                      | 0.08%  | 0.26%  | 0.51%  | 0.76%  | 0.95%  |
| Speculative Grade                     | 3.55%  | 7.27%  | 10.72% | 12.71% | 14.19% |
| All Ratings                           | 0.29%  | 0.72%  | 1.26%  | 1.69%  | 2.03%  |
| <b>Global CDOs</b>                    |        |        |        |        |        |
| Aaa                                   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| Aa                                    | 0.10%  | 0.27%  | 0.72%  | 1.46%  | 1.88%  |
| A                                     | 0.47%  | 1.36%  | 2.54%  | 4.30%  | 4.30%  |
| Baa                                   | 2.22%  | 6.36%  | 11.95% | 16.18% | 19.09% |
| Ba                                    | 4.39%  | 10.55% | 16.48% | 19.36% | 22.66% |
| B                                     | 10.13% | 20.58% | 31.97% | 41.71% | 48.00% |
| Caa                                   | 15.17% | 20.98% | 20.98% | 20.98% | 0.00%  |
| Investment Grade                      | 0.74%  | 2.16%  | 4.21%  | 6.04%  | 7.27%  |
| Speculative Grade                     | 6.50%  | 13.69% | 20.78% | 25.61% | 30.10% |
| All Ratings                           | 1.69%  | 4.11%  | 7.02%  | 9.34%  | 11.05% |

**Figure 39 – Estimated Multi-Year Cumulative Loss Rates by Cohort Rating, 1993-2005**

|                                 | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year |
|---------------------------------|--------|--------|--------|--------|--------|
| <b>Global CDOs excl. HYCBOS</b> |        |        |        |        |        |
| Aaa                             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| Aa                              | 0.12%  | 0.28%  | 0.55%  | 0.92%  | 0.92%  |
| A                               | 0.35%  | 0.86%  | 1.57%  | 2.47%  | 2.47%  |
| Baa                             | 1.15%  | 3.56%  | 6.74%  | 9.14%  | 10.28% |
| Ba                              | 1.86%  | 4.74%  | 7.88%  | 10.11% | 12.60% |
| B                               | 5.80%  | 11.28% | 17.07% | 21.73% | 27.63% |
| Caa                             | 12.16% | 17.50% | 17.50% | 17.50% |        |
| Investment Grade                | 0.40%  | 1.21%  | 2.36%  | 3.36%  | 3.73%  |
| Speculative Grade               | 3.36%  | 6.93%  | 10.58% | 13.51% | 17.07% |
| All Ratings                     | 0.82%  | 2.05%  | 3.58%  | 4.89%  | 5.67%  |

**Figure 40 – Multi-Year Cumulative Loss Rates by Original Rating, 1993-2005**

|                                       | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
|---------------------------------------|--------|--------|--------|--------|--------|--------|--------|
| <b>All Structured Finance</b>         |        |        |        |        |        |        |        |
| Aaa                                   | 0.00%  | 0.00%  | 0.00%  | 0.01%  | 0.02%  | 0.02%  | 0.02%  |
| Aa                                    | 0.00%  | 0.00%  | 0.00%  | 0.32%  | 0.74%  | 0.82%  | 0.85%  |
| A                                     | 0.00%  | 0.08%  | 0.45%  | 1.10%  | 1.78%  | 1.87%  | 1.98%  |
| Baa                                   | 0.02%  | 0.46%  | 2.18%  | 4.43%  | 5.81%  | 6.91%  | 7.07%  |
| Ba                                    | 0.00%  | 1.36%  | 4.00%  | 6.88%  | 8.65%  | 9.42%  | 9.59%  |
| B                                     | 0.14%  | 1.10%  | 7.10%  | 12.39% | 16.22% | 16.88% | 16.88% |
| Investment Grade                      | 0.02%  | 0.19%  | 0.71%  | 1.47%  | 2.04%  | 2.38%  | 2.46%  |
| Speculative Grade                     | 0.15%  | 1.43%  | 5.25%  | 9.20%  | 11.65% | 12.34% | 12.64% |
| All Ratings                           | 0.04%  | 0.33%  | 1.24%  | 2.37%  | 3.16%  | 3.57%  | 3.67%  |
| <b>US ABS</b>                         |        |        |        |        |        |        |        |
| Aaa                                   | 0.00%  | 0.00%  | 0.00%  | 0.01%  | 0.02%  | 0.02%  | 0.03%  |
| Aa                                    | 0.00%  | 0.01%  | 0.01%  | 0.56%  | 1.68%  | 1.87%  | 1.97%  |
| A                                     | 0.00%  | 0.08%  | 0.54%  | 1.50%  | 2.60%  | 2.74%  | 2.94%  |
| Baa                                   | 0.02%  | 0.44%  | 2.20%  | 4.49%  | 6.66%  | 8.81%  | 9.23%  |
| Ba                                    | 0.00%  | 4.34%  | 11.24% | 16.33% | 21.69% | 23.39% | 24.11% |
| B                                     | 0.00%  | 2.31%  | 22.23% | 34.37% | 34.37% | 36.54% | 36.54% |
| Investment Grade                      | 0.04%  | 0.27%  | 0.88%  | 1.75%  | 2.65%  | 3.26%  | 3.44%  |
| Speculative Grade                     | 0.53%  | 4.87%  | 14.50% | 21.79% | 26.19% | 27.77% | 28.42% |
| All Ratings                           | 0.06%  | 0.48%  | 1.52%  | 2.72%  | 3.85%  | 4.52%  | 4.74%  |
| <b>US CMBS</b>                        |        |        |        |        |        |        |        |
| Aaa                                   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| Aa                                    | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| A                                     | 0.00%  | 0.00%  | 0.17%  | 0.17%  | 0.17%  | 0.17%  | 0.17%  |
| Baa                                   | 0.00%  | 0.27%  | 0.90%  | 0.90%  | 0.90%  | 0.90%  | 0.90%  |
| Ba                                    | 0.00%  | 0.17%  | 0.17%  | 0.79%  | 0.79%  | 0.79%  | 0.79%  |
| B                                     | 0.14%  | 0.28%  | 1.92%  | 4.02%  | 6.43%  | 6.93%  | 6.93%  |
| Investment Grade                      | 0.00%  | 0.07%  | 0.34%  | 0.34%  | 0.34%  | 0.34%  | 0.34%  |
| Speculative Grade                     | 0.06%  | 0.23%  | 0.97%  | 2.24%  | 4.03%  | 4.69%  | 5.22%  |
| All Ratings                           | 0.01%  | 0.11%  | 0.52%  | 0.84%  | 1.21%  | 1.33%  | 1.40%  |
| <b>US RMBS</b>                        |        |        |        |        |        |        |        |
| Aaa                                   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.03%  | 0.03%  | 0.03%  |
| Aa                                    | 0.00%  | 0.00%  | 0.00%  | 0.18%  | 0.19%  | 0.19%  | 0.19%  |
| A                                     | 0.00%  | 0.00%  | 0.27%  | 0.47%  | 0.47%  | 0.52%  | 0.52%  |
| Baa                                   | 0.02%  | 0.39%  | 1.19%  | 3.05%  | 3.60%  | 3.70%  | 3.72%  |
| Ba                                    | 0.00%  | 0.09%  | 0.65%  | 1.90%  | 2.27%  | 2.68%  | 2.75%  |
| B                                     | 0.21%  | 0.62%  | 5.41%  | 7.67%  | 8.72%  | 8.72%  | 8.72%  |
| Investment Grade                      | 0.00%  | 0.06%  | 0.26%  | 0.73%  | 0.90%  | 0.93%  | 0.94%  |
| Speculative Grade                     | 0.08%  | 0.29%  | 2.33%  | 3.96%  | 4.63%  | 4.87%  | 4.95%  |
| All Ratings                           | 0.01%  | 0.09%  | 0.56%  | 1.20%  | 1.43%  | 1.50%  | 1.51%  |
| <b>US ABS (excl. both MH and HEL)</b> |        |        |        |        |        |        |        |
| Aaa                                   | 0.00%  | 0.00%  | 0.00%  | 0.02%  | 0.02%  | 0.03%  | 0.03%  |
| Aa                                    | 0.00%  | 0.04%  | 0.04%  | 0.70%  | 1.88%  | 2.33%  | 2.33%  |
| A                                     | 0.00%  | 0.08%  | 0.43%  | 1.04%  | 1.80%  | 1.85%  | 1.91%  |
| Baa                                   | 0.11%  | 0.65%  | 2.83%  | 4.38%  | 5.12%  | 5.72%  | 5.72%  |
| Ba                                    | 0.00%  | 3.10%  | 10.10% | 15.12% | 18.10% | 19.12% | 20.09% |
| B                                     | 0.00%  | 3.69%  | 37.89% | 43.61% | 43.61% | 43.61% | 43.61% |
| Investment Grade                      | 0.10%  | 0.39%  | 0.90%  | 1.45%  | 1.91%  | 2.15%  | 2.17%  |
| Speculative Grade                     | 0.81%  | 4.20%  | 15.19% | 21.28% | 23.97% | 24.54% | 25.29% |
| All Ratings                           | 0.14%  | 0.58%  | 1.45%  | 2.17%  | 2.72%  | 2.96%  | 3.00%  |

**Figure 40 – Multi-Year Cumulative Loss Rates by Original Rating, 1993-2005**

|                                 | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
|---------------------------------|--------|--------|--------|--------|--------|--------|--------|
| <b>US RMBS &amp; HEL</b>        |        |        |        |        |        |        |        |
| Aaa                             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.02%  | 0.02%  | 0.02%  |
| Aa                              | 0.00%  | 0.00%  | 0.00%  | 0.12%  | 0.12%  | 0.12%  | 0.12%  |
| A                               | 0.00%  | 0.00%  | 0.17%  | 0.37%  | 0.48%  | 0.51%  | 0.60%  |
| Baa                             | 0.01%  | 0.19%  | 0.76%  | 2.29%  | 3.17%  | 3.47%  | 3.53%  |
| Ba                              | 0.00%  | 0.21%  | 0.98%  | 2.50%  | 3.84%  | 4.52%  | 4.62%  |
| B                               | 0.19%  | 0.73%  | 6.06%  | 10.18% | 10.99% | 11.71% | 11.71% |
| Investment Grade                | 0.00%  | 0.04%  | 0.21%  | 0.61%  | 0.83%  | 0.91%  | 0.93%  |
| Speculative Grade               | 0.06%  | 0.40%  | 2.71%  | 5.05%  | 6.18%  | 6.89%  | 7.04%  |
| All Ratings                     | 0.01%  | 0.08%  | 0.48%  | 1.11%  | 1.44%  | 1.59%  | 1.62%  |
| <b>US HEL</b>                   |        |        |        |        |        |        |        |
| Aaa                             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| Aa                              | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| A                               | 0.00%  | 0.00%  | 0.07%  | 0.27%  | 0.52%  | 0.52%  | 0.84%  |
| Baa                             | 0.00%  | 0.05%  | 0.39%  | 1.48%  | 2.91%  | 3.61%  | 3.79%  |
| Ba                              | 0.00%  | 0.62%  | 2.09%  | 4.41%  | 9.37%  | 11.35% | 11.73% |
| B                               | 0.00%  | 1.47%  | 9.76%  | 20.35% | 20.35% | 23.49% | 23.49% |
| Investment Grade                | 0.00%  | 0.02%  | 0.13%  | 0.42%  | 0.77%  | 0.95%  | 1.04%  |
| Speculative Grade               | 0.00%  | 0.91%  | 4.26%  | 8.79%  | 11.65% | 14.48% | 14.96% |
| All Ratings                     | 0.00%  | 0.06%  | 0.36%  | 0.97%  | 1.53%  | 1.93%  | 2.06%  |
| <b>Global CDOs</b>              |        |        |        |        |        |        |        |
| Aaa                             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| Aa                              | 0.00%  | 0.00%  | 0.00%  | 0.24%  | 1.03%  | 1.16%  | 1.33%  |
| A                               | 0.00%  | 0.48%  | 1.16%  | 2.73%  | 5.11%  | 5.11%  | 5.11%  |
| Baa                             | 0.08%  | 1.05%  | 5.69%  | 12.41% | 15.73% | 18.80% | 18.80% |
| Ba                              | 0.00%  | 3.01%  | 9.90%  | 16.38% | 19.87% | 19.87% | 19.87% |
| B                               | 0.00%  | 7.53%  | 25.24% | 41.94% | 50.09% | 51.19% | 51.19% |
| Investment Grade                | 0.04%  | 0.40%  | 1.88%  | 4.24%  | 5.77%  | 7.02%  | 7.15%  |
| Speculative Grade               | 0.00%  | 3.72%  | 12.52% | 22.21% | 27.17% | 28.31% | 28.31% |
| All Ratings                     | 0.06%  | 0.82%  | 3.31%  | 6.77%  | 8.87%  | 10.25% | 10.41% |
| <b>Global CDOs excl. HYCBOS</b> |        |        |        |        |        |        |        |
| Aaa                             | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| Aa                              | 0.00%  | 0.00%  | 0.00%  | 0.33%  | 1.16%  | 1.16%  | 1.16%  |
| A                               | 0.00%  | 0.26%  | 0.76%  | 1.81%  | 2.80%  | 2.80%  | 2.80%  |
| Baa                             | 0.10%  | 0.87%  | 3.99%  | 7.59%  | 8.82%  | 8.82%  | 8.82%  |
| Ba                              | 0.00%  | 1.25%  | 4.35%  | 7.99%  | 10.65% | 10.65% | 10.65% |
| B                               | 0.00%  | 4.41%  | 4.41%  | 13.33% | 13.33% | 15.88% | 15.88% |
| Investment Grade                | 0.05%  | 0.29%  | 1.24%  | 2.53%  | 3.23%  | 3.23%  | 3.23%  |
| Speculative Grade               | 0.00%  | 1.59%  | 4.37%  | 9.53%  | 12.02% | 13.59% | 13.59% |
| All Ratings                     | 0.06%  | 0.46%  | 1.68%  | 3.48%  | 4.46%  | 5.14%  | 5.14%  |

## Appendix 5: List of 2005 New Impairments<sup>16</sup>

| Deal Name  | Tranche Name | Sector | Asset Type            | Closing Date | Tranche Original Balance | Original Rating | Material Impairment Year | Material Impairment Month (1=January, etc.) | Payment Default? | Ca or C? |
|--|--------------|--------|-----------------------|--------------|--------------------------|-----------------|--------------------------|---|------------------|----------|
| ACLC Business Loan Receivables Trust 1998-2  | C            | ABS    | Franchise Loans       | 12/30/1998   | 16,248,000               | A2              | 2005                     | 3   | Y                | N        |
| ACLC Business Loan Receivables Trust 1999-1  | Class B      | ABS    | Franchise Loans       | 6/4/1999     | 17,672,000               | Aa2             | 2005                     | 1   | Y                | N        |
| ACLC Business Loan Receivables Trust 2000-1  | Class B      | ABS    | Franchise Loans       | 8/1/2000     | 16,275,000               | Aa2             | 2005                     | 8   | N                | Y        |
| FFCA Secured Franchise Lending Corporation   | Class B-2    | ABS    | Franchise Loans       | 10/12/1999   | 5,390,000                | Aa2             | 2005                     | 3   | Y                | Y        |
| FFCA Secured Franchise Loan Grantor Trust 2000-1   | Class D      | ABS    | Franchise Loans       | 11/29/2000   | 10,156,000               | A3              | 2005                     | 9   | Y                | N        |
| FFCA Secured Franchise Loan Owner Trust 2000-1   | Class D      | ABS    | Franchise Loans       | 11/29/2000   | 10,156,000               | A3              | 2005                     | 9   | Y                | Y        |
| Aircraft Finance Trust, Series 1999-1  | Class B      | ABS    | Leases – Aircraft     | 5/5/1999     | 126,500,000              | A2              | 2005                     | 6   | Y                | N        |
| Aircraft Finance Trust, Series 1999-1  | Class C      | ABS    | Leases – Aircraft     | 5/5/1999     | 106,000,000              | Baa2            | 2005                     | 2   | Y                | N        |
| ALPS 96-1  | Class B      | ABS    | Leases – Aircraft     | 6/27/1996    | 56,868,750               | A2              | 2005                     | 12  | Y                | N        |
| DVI Receivables VIII, L.L.C.   | Class C      | ABS    | Leases – Equipment    | 7/27/1999    | 7,537,000                | A2              | 2005                     | 2   | Y                | Y        |
| DVI Receivables VIII, L.L.C.   | Class D      | ABS    | Leases – Equipment    | 7/27/1999    | 5,024,000                | Baa2            | 2005                     | 2   | Y                | N        |
| Access Financial MH Contract Trust 1996-1  | B-1          | ABS    | Manufactured Housing  | 5/29/1996    | 17,551,000               | Baa3            | 2005                     | 3   | Y                | N        |
| Lehman ABS Manufactured Housing Contract Trust 2001-B  | Cl. B-2      | ABS    | Manufactured Housing  | 11/2/2001    | 49,548,738               | Ba2             | 2005                     | 5   | Y                | Y        |
| Origen Manufactured Housing Contract Senior/Subordinate Asset-Backed Certificates, Series 2001-A | Cl. M-2      | ABS    | Manufactured Housing  | 3/27/2001    | 12,787,500               | A2              | 2005                     | 2   | Y                | N        |
| Green Tree Recreational, Equipment & Consumer Trust 1997-A                                       | Certificates | ABS    | ABS – Other           | 3/20/1997    | 15,000,000               | Baa1            | 2005                     | 2   | N                | Y        |
| CIT RV Trust 1998-A  | Certificates | ABS    | Recreational Vehicles | 6/15/1998    | 6,060,865                | Baa3            | 2005                     | 12  | Y                | N        |
| CIT RV Trust 1999-A  | Certificates | ABS    | Recreational Vehicles | 5/19/1999    | 11,515,205               | Baa3            | 2005                     | 5   | Y                | Y        |
| FIB Business Loan Trust 2000-A   | Class M-1    | ABS    | Small Business Loans  | 6/28/2000    | 2,600,000                | A2              | 2005                     | 3   | Y                | N        |
| FIB Business Loan Trust 2000-A   | Class M-2    | ABS    | Small Business Loans  | 6/28/2000    | 2,600,000                | Baa2            | 2005                     | 3   | Y                | Y        |
| First International Bank Trust Fund, Series 2000-1   | Class M      | ABS    | Small Business Loans  | 3/24/2000    | 2,860,000                | A2              | 2005                     | 3   | N                | Y        |
| Aames Mortgage Trust 2001-1  | Cl. B        | HEL    | Subprime mortgages    | 3/29/2001    | 6,000,000                | Baa2            | 2005                     | 10  | N                | Y        |
| Aames Mortgage Trust 2001-2  | Cl. B        | HEL    | Subprime mortgages    | 6/28/2001    | 5,625,000                | Baa2            | 2005                     | 2   | Y                | N        |
| Bear Stearns Asset Backed Securities, Inc., 1999-2   | BF           | HEL    | Subprime mortgages    | 10/19/1999   | 7,754,000                | Baa3            | 2005                     | 6   | Y                | N        |
| Conseco Finance Home Equity Loan Trust 2001-A  | Cl. II-B-2   | HEL    | Subprime mortgages    | 1/31/2001    | 13,805,000               | Ba2             | 2005                     | 7   | Y                | Y        |
| Delta Funding Home Equity Loan Trust 2000-3  | Cl. B        | HEL    | Subprime mortgages    | 9/28/2000    | 6,500,000                | Baa3            | 2005                     | 9   | Y                | Y        |
| GE Capital Mtg Services Inc 1998-HE2   | B2           | HEL    | Subprime mortgages    | 6/26/1998    | 1,945,000                | Baa2            | 2005                     | 9   | Y                | Y        |

16. The complete list of all historically impaired non-private structured finance securities in our data sample is available in Moody's structured finance default risk service (SF DRS).



| Deal Name   | Tranche Name  | Sector | Asset Type         | Closing Date | Tranche Original Balance | Original Rating | Material Impairment Year | Material Impairment (1=January, etc.) | Month Payment Default? | Ca or C? |
|---|---|--------|--------------------|--------------|--------------------------|-----------------|--------------------------|---------------------------------------|------------------------|----------|
| IndyMac Home Equity Mortgage Loan Asset-Backed Trust, Series SPMD 2001-B        | Cl. BF  | HEL    | Subprime mortgages | 6/28/2001    | 11,375,000               | Baa2            | 2005                     | 4                                     | Y                      | N        |
| Long Beach Mortgage Loan Trust 2000-1   | Cl. M-3   | HEL    | Subprime mortgages | 12/15/2000   | 17,500,000               | Baa1            | 2005                     | 8                                     | Y                      | N        |
| Long Beach Mortgage Loan Trust 2001-2   | Cl. M-3   | HEL    | Subprime mortgages | 7/20/2001    | 67,760,000               | Baa2            | 2005                     | 3                                     | N                      | Y        |
| Long Beach Mortgage Loan Trust 2001-4, Asset Backed Certificates, Series 2001-4 | Cl. I-M3  | HEL    | Subprime mortgages | 12/3/2001    | 55,120,000               | Baa2            | 2005                     | 9                                     | Y                      | N        |
| Long Beach Mortgage Loan Trust Asset-Backed Certificates, Series 2001-3         | Cl. M-3   | HEL    | Subprime mortgages | 9/24/2001    | 37,538,000               | Baa2            | 2005                     | 8                                     | Y                      | N        |
| Metropolitan Asset Funding, Inc. Series 2000-A                                  | Cl. M-2   | HEL    | Subprime mortgages | 3/30/2000    | 5,578,000                | A2              | 2005                     | 5                                     | Y                      | N        |
| Metropolitan Mortgage Funding, Inc., Series 2000-B                              | Cl. B-1   | HEL    | Subprime mortgages | 9/28/2000    | 9,750,000                | Baa2            | 2005                     | 3                                     | N                      | Y        |
| Saxon Asset Securities Trust 2000-1   | Cl. BF-1  | HEL    | Subprime mortgages | 2/29/2000    | 8,964,000                | Baa2            | 2005                     | 12                                    | N                      | Y        |
| Saxon Asset Securities Trust 2000-4   | Cl. BF-1  | HEL    | Subprime mortgages | 12/20/2000   | 4,500,000                | Baa2            | 2005                     | 3                                     | N                      | Y        |
| BlackRock Capital Finance L.L.C. 1997-R2  | B-5   | HEL    | HEL - Other        | 6/23/1997    | 6,264,000                | B2              | 2005                     | 4                                     | Y                      | N        |
| CSFB Trust 2002-NP14  | Cl. B-1   | HEL    | HEL - Other        | 8/9/2002     | 3,020,000                | Baa2            | 2005                     | 9                                     | Y                      | N        |
| CSFB Trust 2002-NP14  | Cl. B-2   | HEL    | HEL - Other        | 8/9/2002     | 1,208,000                | Ba2             | 2005                     | 9                                     | Y                      | Y        |
| RAMP Series 2002-RS2 Trust  | Cl. M-I-3   | HEL    | HEL - Other        | 3/27/2002    | 7,726,000                | Baa2            | 2005                     | 7                                     | Y                      | N        |
| SBMS VII 1997-HUD1  | B-4   | HEL    | HEL - Other        | 4/30/1997    | 11,415,000               | Ba2             | 2005                     | 3                                     | Y                      | Y        |
| Archimedes Funding, L.L.C.  | \$36,000,000 Class B-2 Fixed Rate Second Priority Sr Sec Notes due 11/08/09 | CDO    | HY CLO             | 11/5/1997    | 36,000,000               | Baa3            | 2005                     | 4                                     | Y                      | Y        |
| ABS Capital Funding, Ltd.   | Class B-2 Second Priority Fixed Rate Term Notes Due 2033                    | CDO    | SF CDOs            | 12/20/2000   | 13,000,000               | Baa2            | 2005                     | 4                                     | Y                      | N        |
| Aspen Funding I, Ltd.   | U.S. \$5,500,000 Class B-1 9.06% Notes Due July 2037                        | CDO    | SF CDOs            | 5/30/2002    | 5,500,000                | Baa3            | 2005                     | 5                                     | Y                      | N        |
| Capital Guardian ABS CDO I  | Class C Mezzanine Secured Floating Rate Notes due April 2037                | CDO    | SF CDOs            | 2/28/2002    | 14,100,000               | Baa2            | 2005                     | 4                                     | Y                      | Y        |

| Deal Name                                    | Tranche Name   | Sector | Asset Type | Closing Date | Tranche Original Balance | Original Rating | Material Impairment Year | Material Impairment (1=January, etc.) | Month Payment Default? | Ca or C? |
|--|--|--------|------------|--------------|--------------------------|-----------------|--------------------------|---------------------------------------|------------------------|----------|
| Capital Guardian ABS CDO I                   | Preference Shares  | CDO    | SF CDOs    | 2/28/2002    | 15,000,000               | Ba3             | 2005                     | 10                                    | Y                      | N        |
| Fulton Street CDO, Ltd.                      | U.S. \$7,000,000 Class C Fixed Rate Notes Due April 20, 2037                     | CDO    | SF CDOs    | 3/15/2002    | 7,000,000                | Ba2             | 2005                     | 7                                     | Y                      | Y        |
| Galleria CBO IV (formerly Beacon Hill II)    | \$14,000,000 Class B Second Priority Floating Rate Term Notes, Due 2034          | CDO    | SF CDOs    | 7/19/2001    | 14,000,000               | Aa2             | 2005                     | 5                                     | Y                      | N        |
| Harbourview CDO III, Limited                 | \$22,500,000 Class B Second Priority Senior Secured Floating Rate Notes Due 2036 | CDO    | SF CDOs    | 4/24/2001    | 22,500,000               | Aa2             | 2005                     | 6                                     | Y                      | Y        |
| MID OCEAN CBO 2000-1 LTD.                    | Class B-1 6.9889% Notes  | CDO    | SF CDOs    | 1/8/2001     | 12,500,000               | Baa3            | 2005                     | 1                                     | Y                      | Y        |
| MKP CBO II, Ltd.                             | \$12,500,000 Class C-2 Third Priority Fixed Rate Term Notes, Due 2036            | CDO    | SF CDOs    | 12/20/2001   | 12,500,000               | Baa2            | 2005                     | 2                                     | Y                      | N        |
| MWAM CBO 2001-1, LTD.                        | U.S. \$8,125,000 Class C-2 Fixed Rate Notes Due January 30, 2031                 | CDO    | SF CDOs    | 1/25/2001    | 8,125,000                | Baa2            | 2005                     | 1                                     | N                      | Y        |
| Solstice ABS CBO, Ltd./Solstice ABS CBO Inc. | U.S. \$12,500,000 Class C Mezzanine Floating Rate Notes Due 2036                 | CDO    | SF CDOs    | 4/19/2001    | 12,500,000               | Baa2            | 2005                     | 10                                    | Y                      | Y        |

| Deal Name  | Tranche Name   | Sector | Asset Type | Closing Date | Tranche Original Balance | Original Rating | Material Impairment Year | Material Impairment (1=January, etc.) | Month Payment Default? | Ca or C? |
|--|--|--------|------------|--------------|--------------------------|-----------------|--------------------------|---------------------------------------|------------------------|----------|
| Solstice II  | U.S. \$22,000,000 Class C Mezzanine Floating Rate Notes due 2038 | CDO    | SF CDOs    | 5/9/2002     | 22,000,000               | Baa2            | 2005                     | 5                                     | Y                      | Y        |
| Trainer Wortham First Republic CBO II, Limited   | U.S. \$7,600,000 Class B-1L Floating Rate Notes Due 2037         | CDO    | SF CDOs    | 2/28/2002    | 7,600,000                | Baa3            | 2005                     | 10                                    | Y                      | N        |
| Trainer Wortham First Republic CBO II, Limited   | Preference Shares  | CDO    | SF CDOs    | 2/28/2002    | 18,000,000               | Ba3             | 2005                     | 10                                    | Y                      | Y        |
| Bear Stearns Commercial Mortgage Securities Inc 1999-C1  | J  | CMBS   | Conduits   | 2/10/1999    | 2,390,020                | B3              | 2005                     | 2                                     | Y                      | Y        |
| CS First Boston Mortgage Securities Corp 1998-C2   | I  | CMBS   | Conduits   | 11/24/1998   | 19,200,000               | B3              | 2005                     | 11                                    | Y                      | N        |
| CS First Boston Mortgage Securities Corp 1999-C1   | L  | CMBS   | Conduits   | 11/10/1999   | 15,800,000               | B2              | 2005                     | 5                                     | Y                      | N        |
| CS First Boston Mortgage Securities Corp 1999-C1   | M  | CMBS   | Conduits   | 11/10/1999   | 9,300,000                | B3              | 2005                     | 1                                     | Y                      | N        |
| CS First Boston Mortgage Securities Corp 2001-CF2  | CI. M  | CMBS   | Conduits   | 4/27/2001    | 9,854,000                | B2              | 2005                     | 12                                    | Y                      | N        |
| CS First Boston Mortgage Securities Corp 2001-CF2  | CI. N  | CMBS   | Conduits   | 4/27/2001    | 5,474,000                | B3              | 2005                     | 9                                     | Y                      | N        |
| DLJ Commercial Mortgage Corp. 1999-CG3   | B-8  | CMBS   | Conduits   | 10/12/1999   | 8,993,000                | B3              | 2005                     | 10                                    | Y                      | N        |
| DLJ Commercial Mortgage Trust 2000-CKP1  | CI. B-7  | CMBS   | Conduits   | 11/6/2000    | 9,675,000                | B1              | 2005                     | 3                                     | Y                      | Y        |
| First Union National Bank – Bank of America, N.A. Commercial Mortgage Pass-Through Certificates Series 2001-C1 | CI. P  | CMBS   | Conduits   | 3/30/2001    | 6,542,000                | B3              | 2005                     | 12                                    | Y                      | Y        |
| J.P. Morgan Commercial Mortgage Finance Corp. 2000-C10   | CI. M  | CMBS   | Conduits   | 9/28/2000    | 5,539,000                | B3              | 2005                     | 11                                    | Y                      | N        |
| LB-UBS Commercial Mortgage Trust 2000-C5   | CI. N  | CMBS   | Conduits   | 12/6/2000    | 4,980,000                | B3              | 2005                     | 7                                     | Y                      | N        |
| LB-UBS Commercial Mortgage Trust 2001-C2   | CI. N  | CMBS   | Conduits   | 5/24/2001    | 6,712,000                | B3              | 2005                     | 10                                    | Y                      | N        |
| LB-UBS Commercial Mortgage Trust 2001-C2   | CI. P  | CMBS   | Conduits   | 5/24/2001    | 3,355,000                | Caa2            | 2005                     | 3                                     | Y                      | N        |
| Merrill Lynch Mortgage Trust Commercial Mortgage Pass-Through Certificates, Series 2002-MW1                    | CI. H  | CMBS   | Conduits   | 7/11/2002    | 18,945,000               | Ba1             | 2005                     | 11                                    | Y                      | N        |
| Merrill Lynch Mortgage Trust Commercial Mortgage Pass-Through Certificates, Series 2002-MW1                    | CI. J  | CMBS   | Conduits   | 7/11/2002    | 16,239,000               | Ba2             | 2005                     | 11                                    | N                      | Y        |
| Merrill Lynch Mortgage Trust Commercial Mortgage Pass-Through Certificates, Series 2002-MW1                    | CI. K  | CMBS   | Conduits   | 7/11/2002    | 5,413,000                | Ba3             | 2005                     | 11                                    | Y                      | N        |
| Merrill Lynch Mortgage Trust Commercial Mortgage Pass-Through Certificates, Series 2002-MW1                    | CI. L  | CMBS   | Conduits   | 7/11/2002    | 8,120,000                | B1              | 2005                     | 10                                    | Y                      | N        |
| Merrill Lynch Mortgage Trust Commercial Mortgage Pass-Through Certificates, Series 2002-MW1                    | CI. M  | CMBS   | Conduits   | 7/11/2002    | 13,532,000               | B2              | 2005                     | 3                                     | Y                      | N        |
| Merrill Lynch Mortgage Trust Commercial Mortgage Pass-Through Certificates, Series 2002-MW1                    | CI. N  | CMBS   | Conduits   | 7/11/2002    | 5,413,000                | B3              | 2005                     | 1                                     | Y                      | Y        |
| Prudential Securities Secured Financing Corporation, Series KEY 2000-C1  | CI. N  | CMBS   | Conduits   | 6/29/2000    | 6,122,000                | B3              | 2005                     | 5                                     | Y                      | Y        |

| Deal Name   | Tranche Name | Sector | Asset Type   | Closing Date | Tranche Original Balance | Original Rating | Material Impairment Year | Material Impairment (1=January, etc.) | Month Payment Default? | Ca or C? |
|---|--------------|--------|--------------|--------------|--------------------------|-----------------|--------------------------|---------------------------------------|------------------------|----------|
| Salomon Brothers Commercial Mortgage Trust 2001-C1  | CI. K        | CMBS   | Conduits     | 7/30/2001    | 7,176,000                | Ba3             | 2005                     | 9                                     | Y                      | Y        |
| Salomon Brothers Commercial Mortgage Trust 2001-C1  | CI. L        | CMBS   | Conduits     | 7/30/2001    | 7,177,000                | B1              | 2005                     | 9                                     | Y                      | N        |
| Salomon Brothers Commercial Mortgage Trust 2001-C1  | CI. M        | CMBS   | Conduits     | 7/30/2001    | 7,176,000                | B2              | 2005                     | 4                                     | Y                      | Y        |
| Salomon Brothers Commercial Mortgage Trust 2001-C1  | CI. N        | CMBS   | Conduits     | 7/30/2001    | 4,784,000                | B3              | 2005                     | 1                                     | N                      | Y        |
| Salomon Brothers Mortgage Securities VII, Inc. 2000-C1  | CI. M        | CMBS   | Conduits     | 6/1/2000     | 7,295,000                | B2              | 2005                     | 8                                     | Y                      | Y        |
| Salomon Brothers Mortgage Securities VII, Inc. 2000-C2  | CI. J        | CMBS   | Conduits     | 8/24/2000    | 13,732,000               | Ba2             | 2005                     | 11                                    | N                      | Y        |
| Salomon Brothers Mortgage Securities VII, Inc. 2000-C2  | CI. K        | CMBS   | Conduits     | 8/24/2000    | 5,885,000                | Ba3             | 2005                     | 8                                     | Y                      | N        |
| Salomon Brothers Mortgage Securities VII, Inc., CDC Securitization Corporation Commercial Mortgage Pass-Through Certificates, Series 2001-CDC | CI. E-GF     | CMBS   | Conduits     | 5/30/2001    | 5,710,000                | Ba1             | 2005                     | 3                                     | Y                      | Y        |
| Salomon Brothers Mortgage Securities VII, Inc., CDC Securitization Corporation Commercial Mortgage Pass-Through Certificates, Series 2001-CDC | CI. F-GF     | CMBS   | Large Loans  | 5/30/2001    | 3,485,000                | Ba3             | 2005                     | 3                                     | Y                      | Y        |
| Asset Securitization Corporation 1997-MD VII  | A-4          | CMBS   | Large Loans  | 3/27/1997    | 37,467,611               | Baa2            | 2005                     | 3                                     | Y                      | N        |
| GMAC Commercial Mortgage Securities, Inc. 2000-C1   | CI. L        | CMBS   | Conduits     | 3/16/2000    | 10,998,000               | B2              | 2005                     | 12                                    | Y                      | N        |
| Morgan Stanley Capital I Inc. 1997-XL1  | G            | CMBS   | Large Loans  | 10/17/1997   | 264,08,000               | Ba3             | 2005                     | 9                                     | N                      | Y        |
| CSFB Mortgage Pass-Through Certificates, Series 2002-9  | CI. I-B-5    | RMBS   | Alt-A, prime | 3/28/2002    | 1,128,801                | B3              | 2005                     | 3                                     | Y                      | N        |
| CSFB Mortgage Pass-Through Certificates, Series 2002-AR8  | CI. C-B-4    | RMBS   | Alt-A, prime | 3/27/2002    | 2,020,000                | Ba3             | 2005                     | 6                                     | Y                      | Y        |
| CSFB Mortgage-Backed Pass-Through Certificates, Series 2001-28  | CI. I-B-3    | RMBS   | Alt-A, prime | 11/30/2001   | 1,524,608                | Baa2            | 2005                     | 9                                     | N                      | Y        |
| CSFB Mortgage-Backed Pass-Through Certificates, Series 2001-28  | CI. I-B-4    | RMBS   | Alt-A, prime | 11/30/2001   | 762,304                  | Ba2             | 2005                     | 7                                     | Y                      | N        |
| CSFB Mortgage-Backed Pass-Through Certificates, Series 2001-28  | CI. I-B-5    | RMBS   | Alt-A, prime | 11/30/2001   | 457,382                  | B2              | 2005                     | 3                                     | Y                      | N        |
| CSFB Mortgage-Backed Pass-Through Certificates, Series 2002-10  | I-B          | RMBS   | Alt-A, prime | 4/30/2002    | 1,061,592                | Baa2            | 2005                     | 7                                     | Y                      | N        |
| CSFB Mortgage-Backed Pass-Through Certificates, Series 2002-10  | II-B-4       | RMBS   | Alt-A, prime | 4/30/2002    | 799,605                  | Ba3             | 2005                     | 11                                    | Y                      | N        |
| CSFB Mortgage-Backed Pass-Through Certificates, Series 2002-10  | II-B-5       | RMBS   | Alt-A, prime | 4/30/2002    | 599,703                  | B3              | 2005                     | 1                                     | Y                      | N        |
| DLJ Mtg Acpt Corp 1994-Q07  | B-1          | RMBS   | Alt-A, prime | 4/28/1994    | 5,178,656                | Baa3            | 2005                     | 3                                     | Y                      | N        |
| DLJ Mtg Acpt Corp 1996-QA   | M            | RMBS   | Alt-A, prime | 2/15/1996    | 2,531,094                | Aa3             | 2005                     | 10                                    | N                      | Y        |
| IndyMac ARM Trust Mortgage Pass-Through Certificates, Series 2001-H1  | CI. B-3      | RMBS   | Alt-A, prime | 7/31/2001    | 2,879,700                | Baa2            | 2005                     | 5                                     | N                      | Y        |

## Related Research

### Special Comments:

[Default & Loss Rates of Structured Finance Securities: 1993-2004, July 2005](#)

[Default & Loss Rates of U.S. CDOs: 1993-2003, March 2005](#)

[Default & Loss Rates of Structured Finance Securities: 1993-2003, September 2004](#)

[Measuring Loss Severity Rates of Defaulted Residential Mortgage Backed Securities: A Methodology, April 2004](#)

[Payment Defaults and Material Impairments of U.S. Structured Finance Securities: 1993-2002, December 2003](#)

[European Structured Finance Rating Transitions: 1988-2005, February 2006](#)

[Structured Finance Rating Transitions: 1983-2005, February 2006](#)

[Structured Finance Rating Transitions: 1983-2004, February 2005](#)

[Structured Finance Rating Transitions: 1983-2003, February 2004](#)

[Structured Finance Rating Transitions: 1983-2002, Comparisons with Corporate Ratings and Across Sectors, January 2003](#)

[Structured Finance Watchlist Resolutions: 1992-2003, June 2004](#)

[The Performance of Structured Finance Ratings: Mid-Year 2005 Report, September 2005](#)

[The Relationship between Par Coupon Spreads and Credit Ratings in US Structured Finance, December 2005](#)

[Guide to Moody's Default Research: January 2006 Update, January 2006](#)

[Default and Recovery Rates of Corporate Bond Issuers, 1920-2005, March 2006](#)

*To access any of these reports, click on the entry above. Note that these references are current as of the date of publication of this report and that more recent reports may be available. All research may not be available to all clients.*

PAGE INTENTIONALLY LEFT BLANK

To order reprints of this report (100 copies minimum), please call 1.212.553.1658.  
Report Number: 97234

| <b>Author</b>  | <b>Editor</b>       | <b>Production Associate</b> |
|----------------|---------------------|-----------------------------|
| <i>Jian Hu</i> | <i>Nathan Trier</i> | <i>Wing Chan</i>            |

© Copyright 2006, Moody's Investors Service, Inc. and/or its licensors and affiliates including Moody's Assurance Company, Inc. (together, "MOODY'S"). All rights reserved. **ALL INFORMATION CONTAINED HEREIN IS PROTECTED BY COPYRIGHT LAW AND NONE OF SUCH INFORMATION MAY BE COPIED OR OTHERWISE REPRODUCED, REPACKAGED, FURTHER TRANSMITTED, TRANSFERRED, DISSEMINATED, REDISTRIBUTED OR RESOLD, OR STORED FOR SUBSEQUENT USE FOR ANY SUCH PURPOSE, IN WHOLE OR IN PART, IN ANY FORM OR MANNER OR BY ANY MEANS WHATSOEVER, BY ANY PERSON WITHOUT MOODY'S PRIOR WRITTEN CONSENT.** All information contained herein is obtained by MOODY'S from sources believed by it to be accurate and reliable. Because of the possibility of human or mechanical error as well as other factors, however, such information is provided "as is" without warranty of any kind and MOODY'S, in particular, makes no representation or warranty, express or implied, as to the accuracy, timeliness, completeness, merchantability or fitness for any particular purpose of any such information. Under no circumstances shall MOODY'S have any liability to any person or entity for (a) any loss or damage in whole or in part caused by, resulting from, or relating to, any error (negligent or otherwise) or other circumstance or contingency within or outside the control of MOODY'S or any of its directors, officers, employees or agents in connection with the procurement, collection, compilation, analysis, interpretation, communication, publication or delivery of any such information, or (b) any direct, indirect, special, consequential, compensatory or incidental damages whatsoever (including without limitation, lost profits), even if MOODY'S is advised in advance of the possibility of such damages, resulting from the use of or inability to use, any such information. The credit ratings and financial reporting analysis observations, if any, constituting part of the information contained herein are, and must be construed solely as, statements of opinion and not statements of fact or recommendations to purchase, sell or hold any securities. **NO WARRANTY, EXPRESS OR IMPLIED, AS TO THE ACCURACY, TIMELINESS, COMPLETENESS, MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OF ANY SUCH RATING OR OTHER OPINION OR INFORMATION IS GIVEN OR MADE BY MOODY'S IN ANY FORM OR MANNER WHATSOEVER.** Each rating or other opinion must be weighed solely as one factor in any investment decision made by or on behalf of any user of the information contained herein, and each such user must accordingly make its own study and evaluation of each security and of each issuer and guarantor of, and each provider of credit support for, each security that it may consider purchasing, holding or selling.

MOODY'S hereby discloses that most issuers of debt securities (including corporate and municipal bonds, debentures, notes and commercial paper) and preferred stock rated by MOODY'S have, prior to assignment of any rating, agreed to pay to MOODY'S for appraisal and rating services rendered by it fees ranging from \$1,500 to \$2,400,000. Moody's Corporation (MCO) and its wholly-owned credit rating agency subsidiary, Moody's Investors Service (MIS), also maintain policies and procedures to address the independence of MIS's ratings and rating processes. Information regarding certain affiliations that may exist between directors of MCO and rated entities, and between entities who hold ratings from MIS and have also publicly reported to the SEC an ownership interest in MCO of more than 5%, is posted annually on Moody's website at [www.moody.com](http://www.moody.com) under the heading "Shareholder Relations — Corporate Governance — Director and Shareholder Affiliation Policy."

Moody's Investors Service Pty Limited does not hold an Australian financial services licence under the Corporations Act. This credit rating opinion has been prepared without taking into account any of your objectives, financial situation or needs. You should, before acting on the opinion, consider the appropriateness of the opinion having regard to your own objectives, financial situation and needs.

| Contact           | Phone          |
|-------------------|----------------|
| <b>New York</b>   |                |
| Jian Hu           | 1.212.553.1653 |
| Julia Tung        |                |
| Hadas Alexander   |                |
| Debjani Dutta Roy |                |
| Richard Cantor    |                |
| Nicolas Weill     |                |
| David Rosa        |                |
| Detlef Scholz     |                |

## Default & Loss Rates of Structured Finance Securities: 1993-2006

### Summary Opinion

This *Special Comment* presents Moody's fifth annual report of the material impairment and loss rates of global structured finance securities, covering the credit performance through year-end 2006 of all structured finance securities issued since 1993. The following are the highlights of this report:

- The number of newly impaired tranches rose to 111 in 2006 from 83 in 2005. Of these, 89 suffered principal losses or were downgraded to Ca or C ("principal impairments"), while 22 experienced only interest shortfalls ("interest impairments"), compared to 74 principal impairments and 9 interest impairments in the prior year.<sup>1</sup>
- The US ABS and US CMBS sectors accounted for 81% of the 111 newly impaired securities, with 24 in HEL, 35 in CMBS, and 31 in non-HEL ABS. These numbers are all higher relative to their 2005 levels of 21, 19 and 20 respectively in each of the three sectors. The US RMBS and global CDO sectors continued to experience a small number of impairments with 8 in RMBS and 12 among CDOs, compared to 8 and 15 each in the previous year. In addition, one European non-CDO structured finance security became impaired in 2006.
- Overall, the credit performance of structured finance securities in 2006 was about the same as that in 2005 and remained stronger than historically. In particular, the increase in impairments was offset by the strong growth in the number of ratings outstanding, driving the 12-month material impairment rate down to historical lows (see Figure 1). The one-year investment-grade impairment rate fell to 0.025% in 2006 from 0.045% in 2005, while the one-year speculative-grade impairment rate rose slightly to 2.52% from 2.41%.
- By the end of 2006, 1,152 securities from 634 deals issued since 1993 had become materially impaired, representing roughly 1.8% of the 63,896 structured finance tranches and 3.8% of the 16,769 deals studied. Of these, 1,068 tranches, or 92.7% of all impairments, had suffered principal losses or were downgraded a Ca or C rating, and 84 tranches had experienced only interest shortfalls.
- Final loss severity rates on impaired securities have averaged 54% as a share of original balances for the 425 principal-impaired securities that have reached a resolution (i.e., with no remaining principal balance) as of year-end 2006. Final loss severity rates have historically been higher on resolved ABS impairments, which averaged more than 70% for both investment-grade and speculative-grade impairments, than on resolved RMBS and HEL impairments, which averaged roughly 29% for investment-grade tranches and 45% for speculative-grade tranches.
- Five-year loss rates, estimated based on principal-impaired securities and expressed as a percent of the original balances, have averaged 0.17% for Aaa-rated securities, 1.3% for Aa-rated and single-A-rated securities, 4.2% for Baa-rated securities, and 7.9% for speculative-grade-rated securities. Historical average loss rates, however, have varied substantially across asset classes, with those in the CMBS and RMBS sectors being the lowest among all structured finance sectors.
- Of the \$6.6 trillion worth of U.S. dollar-denominated structured finance tranches in our data sample, 0.47% (by original balance) were materially impaired and 0.43% were principal-impaired by the end of 2006. Using the average final loss severity rate of 54% from the resolved principal-impaired tranches, Moody's estimates the volume-weighted aggregate lifetime loss rate to be about 0.23%.

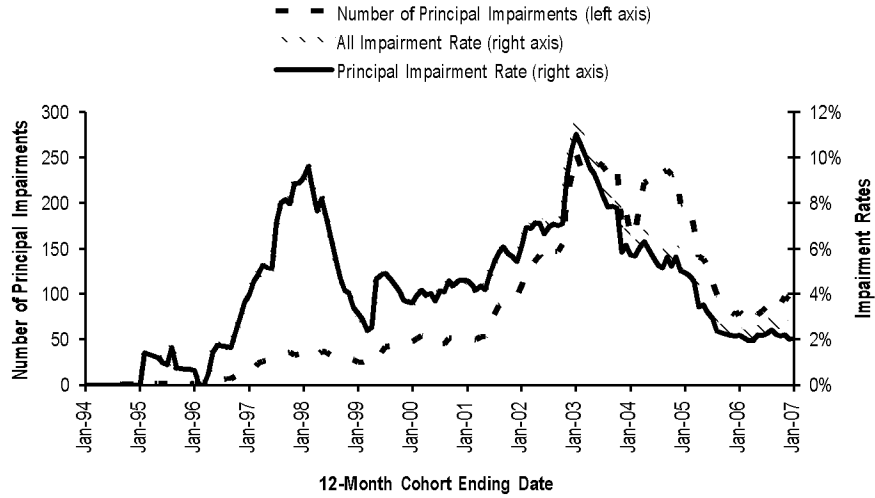
1. The number of impaired securities in 2005 has been revised down due to cures. We expect some of the materially impaired securities in 2006 to be cured, especially for those experiencing only interest shortfalls.





Figure 1

### Trailing 12-Month Speculative-Grade All Material Impairment Rates and Principal Impairment Rates



Note: All structured finance securities issued since 1993 are included. All impairments include both principal impairments (securities that suffered principal losses/write-downs or were downgraded to Ca or C) and interest impairments (securities that experienced only interest shortfalls). If a security had experienced principal write-down/loss or was downgraded to Ca or C, it is called principal impairment regardless of whether it had experienced interest shortfalls. Securities rated Ba1 or below at the beginning of each calendar month are grouped into a speculative-grade rating cohort. The 12-month speculative-grade impairment rate is the number of securities in a speculative-grade rating cohort that became impaired in the subsequent 12-month period, as a share of the total number of securities in the cohort.

---

---

# Table of Contents

---

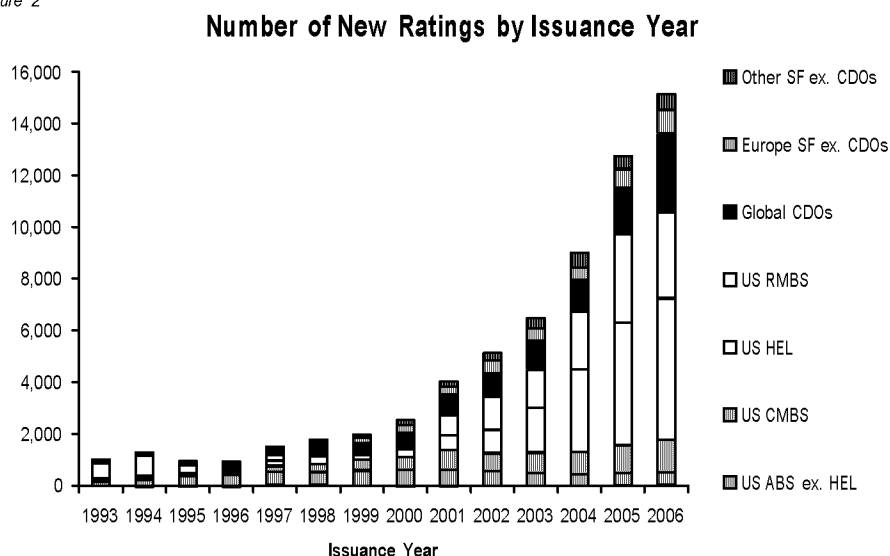
|  | Page |
|--|------|
| Growth and Distribution of Global Structured Finance Ratings.....                        | 4    |
| Structured Finance Material Impairments .....  | 6    |
| Definition of Material Impairment.....   | 6    |
| New Impairments in 2006.....   | 8    |
| Lifetime Impairments as of 2006 .....  | 12   |
| Historical Impairment Correlations across Sectors .....                                  | 15   |
| Sector Specific Analysis of Material Impairments .....                                   | 17   |
| US ABS ex. HEL .....   | 17   |
| US HEL and RMBS .....  | 20   |
| US CMBS .....  | 25   |
| Global CDOs .....  | 28   |
| Loss-Given-Default on Principal-Impaired Tranches and Historical Average Loss Rates..... | 32   |
| LGD for All Resolved Impairments .....   | 32   |
| LGD for Impaired RMBS/HEL Tranches.....  | 33   |
| LGD for Impaired CDO Tranches.....   | 34   |
| LGD for Impaired MH Tranches .....   | 35   |
| LGD by Time Horizon .....  | 35   |
| Historical Average Multi-Year Loss Rates .....   | 37   |
| Appendix 1: Descriptions of Data Sample and Glossary.....                                | 38   |
| Appendix 2: How to Calculate Multi-Year Material Impairment Rate and LGD Rate .....      | 41   |
| Appendix 3: Material Impairment Rates by Rating.....                                     | 44   |
| Appendix 4: Principal Impairment Rates by Rating .....                                   | 50   |
| Appendix 5: Estimated Historical Average Loss Rates by Rating.....                       | 56   |
| Appendix 6: One-Year Rating Transition Matrices with a Principal Impairment Column ..... | 62   |
| Appendix 7: Moody's Idealized Loss Rate Table .....                                      | 64   |
| Appendix 8: List of 2006 Newly Impaired Tranches.....                                    | 65   |
| Related Special Comments and Special Reports .....                                       | 71   |

## GROWTH AND DISTRIBUTION OF GLOBAL STRUCTURED FINANCE RATINGS

2006 was another year of strong growth and superb credit performance for global structured finance, as the market continued to benefit from a healthy global macroeconomic environment, benign corporate credit conditions, and abundant liquidity in the financial system. Moody's reported that the 2006 corporate speculative-grade default rate was at its lowest level since 1981.<sup>2</sup> At the same time, the unemployment rate and inflation rate in the U.S. remained at healthy levels. Although the economy stayed robust, the slowdown in the U.S. housing market that began in 2005 accelerated dramatically in 2006, resulting in broad credit concerns about the securitization market and its potential spill-over effect on the U.S. economy.

Moody's assigned a record number of 15,134 unique new structured finance ratings involving 2,953 transactions in 2006, an increase of 19% over the 12,744 ratings assigned in 2005 (see Figure 2).<sup>3</sup> The growth in the number of new ratings was seen across almost all major sectors. In particular, a record number of 3,038 new ratings were assigned in the global CDO sector in 2006, an increase of 69% over the 1,793 new ratings assigned in 2005.<sup>4</sup> In Europe, the Middle East, and Africa (hereafter Europe), a total of 921 non-CDO ratings were assigned in 2006, representing an increase of 30% over a total of 721 in 2005.

Figure 2



Note: See Appendix 1 for data sample criteria and a glossary of terms.

Strong growth in structured finance ratings in recent years also drove the total number of outstanding ratings at the beginning of 2006 to a record level of 37,035 (Figure 3), about 40% more than that at the beginning of 2005.

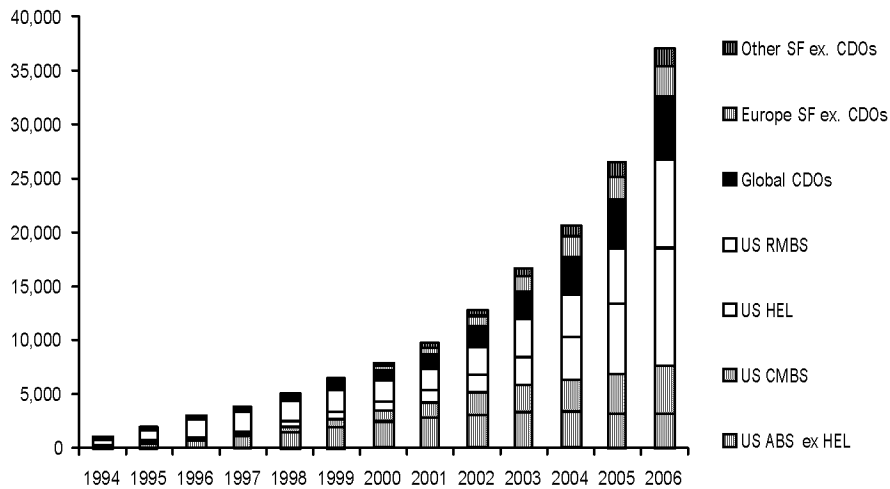
2. See Moody's Special Comment, "Corporate Default and Recovery Rates, 1920-2006," February 2007.

3. This excludes *pari passu* tranches and wrapped tranches. See Appendix 1 for a description of the data sample.

4. Credit derivative securities such as structured notes and repackaged securities are not included in this study.

Figure 3

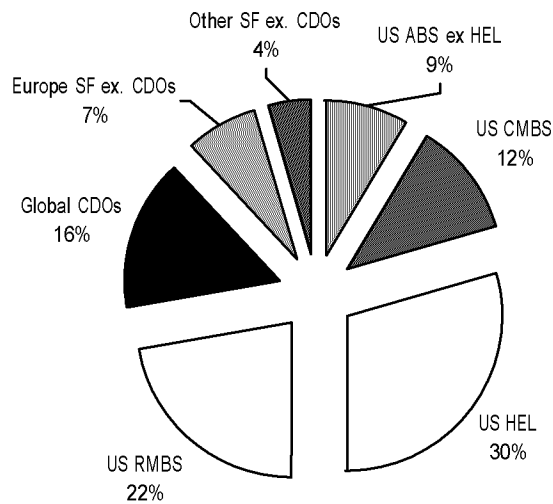
### Number of Ratings Outstanding at the Beginning of Each Year



By sector, more than half of the ratings outstanding at the beginning of 2006 were in the US RMBS and HEL sectors (Figure 4). Global CDOs and US CMBS accounted for 16% and 12%, respectively.

Figure 4

### Distribution of Ratings Outstanding by Sector on 1/1/2006 (Total 37,035)

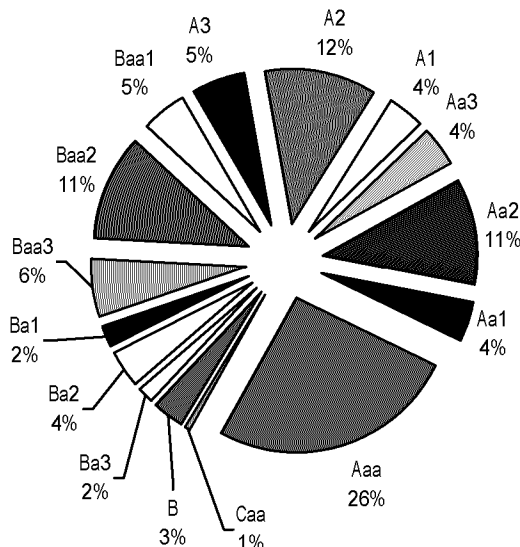


As in the past, Aaa ratings continued to be the leading rating category, making up about 26% of all ratings outstanding at the beginning of 2006 (Figure 5)<sup>5</sup>. In addition, non-Aaa investment-grade ratings accounted for 62% of all outstanding ratings. Within each broad rating category, securities that were rated with the numeric modifier 2 tended to exceed those with modifiers 1 or 3 by a large margin. For example, 11% of ratings outstanding at the beginning of 2006 were Aa2, compared to 4% each for Aa1 and Aa3, and 11% were Baa2, compared to 5% for Baa1 and 6% for Baa3.

5. Excluding *pari passu* tranches greatly reduces the number of rating observations in the Aaa category. If all *pari passu* tranches are included, the total number of Aaa ratings would be about three times more than the number reported in this study.

Figure 5

**Distribution of Ratings Outstanding by Rating Category on 1/1/2006  
(Total 37,035)**



**STRUCTURED FINANCE MATERIAL IMPAIRMENTS**

**Definition of Material Impairment**

Moody's first introduced the concept of material impairment for the analysis of credit performance of structured finance securities in 2003. Structured finance securities are defined as being in material impairment if they have suffered an interest shortfall or a principal write-down that remained outstanding at the end of the study period. Securities that were downgraded to Ca or C, even though they had not yet experienced interest shortfalls or principal losses, are also considered to be materially impaired.

We note that Moody's defined this concept in recognition of the significant differences in the definition of default between the corporate and structured finance sectors.<sup>6</sup> The differences between the concept of default for the corporate and structured finance sectors led to the development of new templates for structured finance CDS contracts first in 2005 and then in 2006. By the end of 2006, standard templates for CDS of ABS, CMBS and CDOs have been published by ISDA. Therefore, it seems to be appropriate and also interesting to highlight some similarities and differences between the CDS events (both floating events and credit events) described in the ISDA templates and the material impairment events tracked in this study.<sup>7</sup> Figure 6 provides a brief comparison.

6. See Moody's Special Comment, "Payment Defaults and Material Impairments of U.S. Structured Finance Securities: 1993-2002," December 2003.  
 7. For the ABS CDS template, please refer to "Credit Derivative Transaction on Asset-Backed Security (Cash or Physical Settlement)," ISDA, June 7, 2006, for the MBS CDS template, please see "Standard Terms Supplement for a Credit Derivative Transaction on Mortgage-Backed Security with Pay-As-You-Go or Physical Settlement (Form I) (Dealer Form) and Form of Confirmation", ISDA, November 10, 2006, and for the CDO CDS template, see "Credit Derivative Transaction on Collateralized Debt Obligation with Pay-As-You-Go or Physical Settlement (Dealer Form)," ISDA, June 7, 2006

Figure 6

### A Comparison between Structured Finance CDS Events and Moody's Material Impairment Events

| Variables under Consideration | Defined Events                        | Floating Amount Event (leads to PAUG settlement) | Credit Event (may lead to physical settlement)        | Moody's Material Impairment Events |
|-------------------------------|---------------------------------------|--|---|------------------------------------|
| Interest                      | Shortfall on MBS tranches             | Yes  | No  | Yes                                |
|                               | Shortfall due to AFC                  | Yes  | No  | No                                 |
|                               | Shortfall on Non-PIKable CDO tranches | Yes  | Yes   | Yes                                |
|                               | PIKing on PIKable CDO tranches        | Yes  | Yes (if PIKed for more than 360 days)                 | Yes                                |
| Principal                     | Explicit principal write-down         | Yes  | Yes   | Yes                                |
|                               | Implied principal write-down          | Yes for MBS<br>Optional for CDOs                 | optional  | No                                 |
|                               | Failure to pay principal at maturity  | Yes  | Yes   | Yes                                |
| Maturity                      | Maturity extension                    | No   | Yes   | Yes                                |
| Catch-all                     | Distressed downgrades                 | No   | Yes (downgrade to Caa2 or below or rating withdrawal) | Yes (downgrade to Ca or C)         |

Notes: PAUG stands for Pay-As-You-Go. AFC stands for Available Funds Cap. PIK stands for Payment-In-Kind. For various other CDS events across different asset classes and Moody's rating methodology on CDS of structured finance instruments, please refer to, "Moody's Approach to Rating Collateralized Debt Obligations with Pay-As-You-Go Credit Default Swaps," November 2006.

Figure 6 illustrates the following similarities and differences.

First, explicit principal write-downs and interest shortfalls (including PIKed interest) are both material impairment events tracked by this study and standard floating events for structured finance CDO contracts. Additionally, Moody's material impairment concept covers explicit principal write-down, principal loss at maturity, and severe downgrade to Ca or C, which are standard credit events for structured finance CDS contracts.

Second, we do not consider interest shortfalls due to the available funds cap (AFC) as material impairments, while most CDS contracts define them as floating events.<sup>8</sup> AFC is a limitation or reduction of interest payments on a structured finance security mostly due to non-credit related limits and reductions in interest on the underlying loans.<sup>9</sup> In some cases, AFC can be the result of a mismatch in benchmark interest rates between assets and liabilities.

Third, we do not consider tranches that are under-collateralized or have been implicitly written down as material impairments, while some CDS contracts consider them to be floating events.<sup>10</sup>

Fourth, PIKing CDO tranches are considered to be materially impaired as PIKing is economically similar to a shortfall of interest except that the PIKed interest is capitalized in the principal balance while regular interest shortfall is not. By comparison, some CDS contracts do not define them as floating events.<sup>11</sup>

Moody's identifies interest shortfalls and principal write-downs among structured finance securities by reviewing all deal performance data records available to us, both in our electronic database and physical remittance and trustee reports. Because of the way we define impairment, the impairment status of a security may change over time as it goes from cured (i.e. all outstanding shortfalls and losses were repaid in full) to uncured (i.e. positive interest shortfalls or principal losses outstanding), or vice versa. In addition, securities with very minor shortfalls or losses are not considered to be materially impaired.

8. Prepayment-related interest shortfalls are also excluded from the definition of material impairment.

9. For the impact of AFC on Moody's structured finance CDS rating, please refer to "Available Funds Caps and the Failure to Pay Credit Event in ABS Credit Default Swaps," Moody's Structured Finance Special Report, December 13, 2005. For Moody's views on how AFC risk may affect investors in structured finance CDOs, please see "Treatment of Available Funds Cap Risk in Cash and Synthetic Structured Finance CDOs," Moody's Structured Finance Special Report, December 13, 2005.

10. For some ABS securities backed by manufactured housing loans, we have recorded deeply under-collateralized securities as impaired. Identifying implied write-downs for all structured finance tranches and determining the nature of such write-downs can be a challenging task.

11. PIKing, like other interest shortfalls in ABS or MBS, has experienced non-trivial cures recently, especially among high-yield collateralized bond obligations (HY CBOs). When all PIKed tranches are included (i.e. including those that were never reported as material impairments in our annual default study because they PIKed and were cured within the same year), the cure rate has been above 20%.

With regard to the cure rate of impaired securities, we have documented in several prior studies that the cure rate in some asset classes such as CMBS and CDOs can be significant, and most cures have occurred among those securities that became impaired due to interest shortfalls.<sup>12</sup> Securities that were impaired due to principal write-down or downgrade to Ca or C have rarely been cured.<sup>13</sup>

As a result of the significant differences in cure rates observed historically and to ensure comparability across different sectors and over time, in this Special Comment, we introduce two additional impairment concepts: principal impairment and interest impairment.

Principal impairments, or principal-impaired securities, include securities that have suffered principal write-downs before maturity or principal losses at maturity and securities that were downgraded to Ca or C because they are virtually certain to sustain losses ultimately.

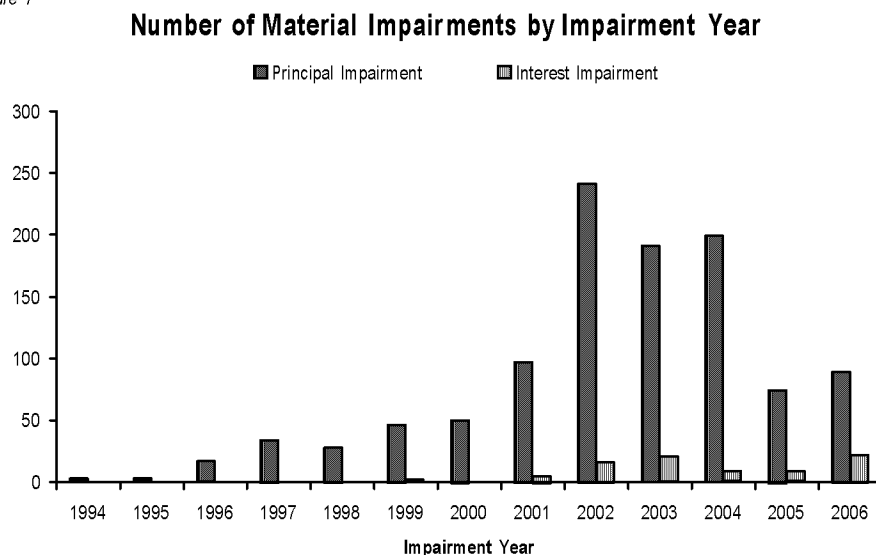
Interest impairments, or interest-impaired securities, include securities that are not principal impaired and have experienced only interest shortfalls. Securities that experienced both principal write-downs and interest shortfalls are considered as being principal-impaired.

The actual classification of these two subcategories of material impairment is based on a security's impairment status at the end of study period, instead of its initial impairment event. For example, if a tranche experienced an interest shortfall initially and then was written down several months later, it would be classified as principal-impaired despite the fact that it was initially interest-impaired. In this case, the impairment date is the date when the interest shortfall, if not cured, was observed. If the interest shortfall was cured before the principal write-down occurred, the first principal write-down date is the material impairment date.

### New Impairments in 2006

A total of 111 securities were newly impaired in 2006, 89 of which suffered principal losses and 22 experienced only interest shortfalls (Figure 7). The total of 111 impairments in 2006 was 28 more than that in 2005, which included 74 principal impairments and 9 interest impairments, and was well below the historical highs observed during 2002-2004.

Figure 7



Note: Principal impairments refer to securities that sustained principal write-down/losses or were downgraded to Ca or C, whereas interest impairments are securities that experienced only interest shortfalls, both as of the end of 2006. Please see Appendix 1 for a glossary of terms.

Similar to 2005, new impairments were concentrated in three major sectors: US ABS ex. HEL, US HEL, and US CMBS, which accounted for 81% of all new impairments and 76% of all new principal impairments in 2006 (Figure 8). Although the total of 35 new CMBS impairments in 2006 is markedly higher than the 19 impairments in 2005, we

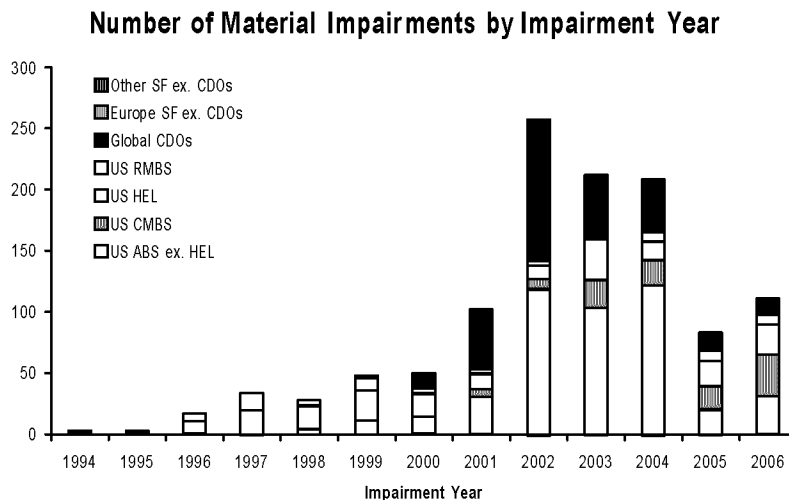
12. For more detailed discussions on cure rate differences across sectors and how they impacted our impairment rate statistics, please see Moody's Special Comment, "Default & Loss Rates of Structured Finance Securities: 1993-2005," April 2005.

13. To date, seven, or 1.5%, of the 465 tranches that experienced principal write-downs were cured, and 18, or 2.0%, of the 895 Ca/C-rated tranches were either paid-in-full or upgraded out of the Ca/C category.

expect some of the new impairments in 2006 to eventually be cured, as 16 of the 35 new impairments were due to interest shortfalls and the sector has historically experienced the highest cure rate.<sup>14</sup> In addition, 12 new CDO tranches and 8 new RMBS tranches were impaired in 2006. These numbers were comparable to those in 2005, which were 15 and 8 in the two sectors, respectively.

In Europe, Class M from an ABS transaction, Marne et Champagne Finance a.r.l, suffered a principal loss of 12.41% at the time of deal termination in March 2006. The loss on the Class M Notes came from the negative carry cost between the cash yield at the level of the Lending Bank which retained the funds for a period of 18 months and the senior fees and interests due on the Notes on a quarterly basis. It was rated Caa2 before impairment. Meanwhile, the A1 and A2 classes that were senior to Class M were both paid in full.

Figure 8



By rating at the beginning of 2006, all 111 newly impaired securities were rated Baa or below (Figures 9 and 10). Figure 9 reports that six new HEL principal impairments and one new RMBS impairment in 2006 were rated Baa while the new principal impairments in all other sectors were rated below investment grade at the start of the year. By comparison, 13 of the 19 new CMBS principal impairments and 18 of the 27 new ABS principal impairments carried Caa ratings at the beginning of 2006.

Both Figure 9 and Figure 10 also exhibit strong correlation between the rating at the beginning of 2006 and the number of impairments, as more securities were found to be impaired in lower rating categories. For historical average one-year broad rating transition matrices with a principal impairment column, please see Appendix 6.

14. To put this in perspective, in last year's study, we reported 32 new impairments for the US CMBS sector. As of the end of 2006, 13 of them had been cured. The cure rate of CMBS impairments has been the highest across all major sectors of structured finance. Historically, when all payment shortfalls are included (including those cured within a year and not reported as material impairments in each year's study), the cure rate of CMBS payment shortfalls was about 60%. Even for materially impaired CMBS securities we reported in the past, the cure rate averaged almost 20%. For more discussions on cure rates by sector, please see Moody's Special Comment, "Default & Loss Rates of Structured Finance Securities: 1993-2005," April 2006.



Figure 9

### Number of New Principal Impairments in 2006 by Rating

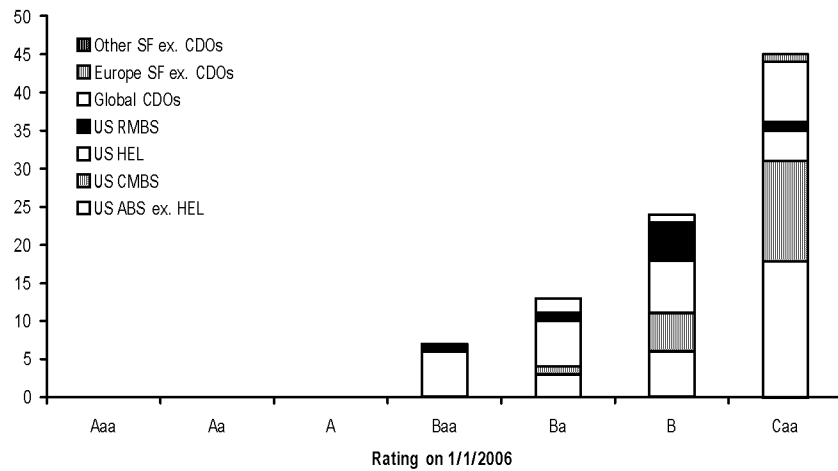
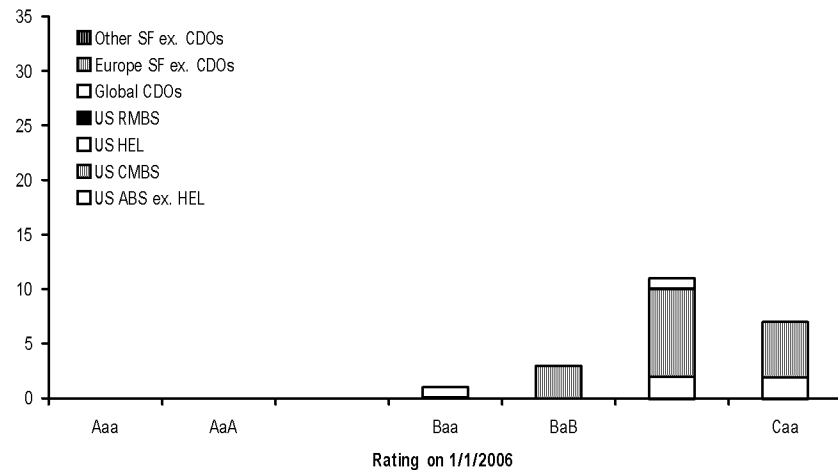


Figure 10

### Number of New Interest Impairments in 2006 by Rating



As the number of new impairments in 2006 continued to remain low, the slight increase in impairments was more than offset by the strong growth in the number of outstanding ratings. Consequently, the one-year impairment rate in 2006 - the number of newly impaired tranches as a percentage of the total tranches outstanding at the beginning of 2006 - was similar to the 2005 level for most structured finance sectors.

Figure 11 shows that within the investment-grade category, which includes securities rated Aaa, Aa, single-A and Baa, the trailing 12-month impairment rate was at a historical low level of roughly 0.025% at the end of 2006. Within the speculative-grade category, which includes securities rated Ba, single-B or Caa, the one-year impairment rate was up slightly from 2.41% for the 12-month cohort ending 2005 to 2.52% for the 12-month cohort ending 2006 for all impairments, but was down slightly from 2.16% to 2.01% for principal impairments.

Figure 11

### Trailing 12-Month Investment-Grade Impairment Rates

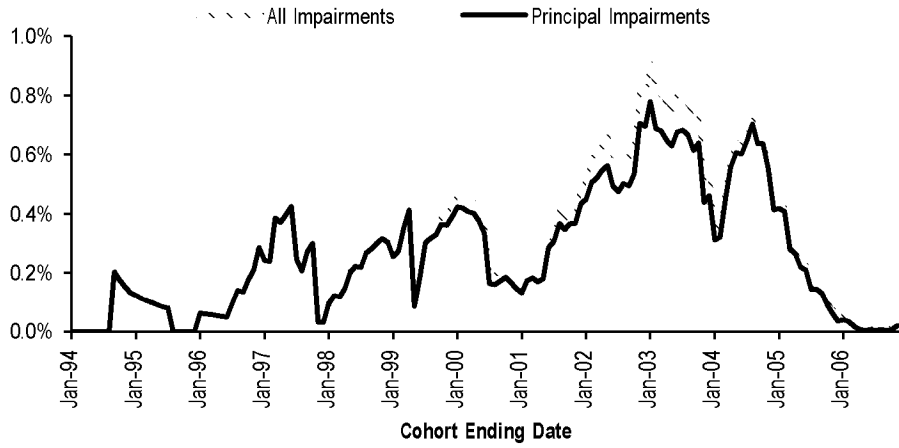
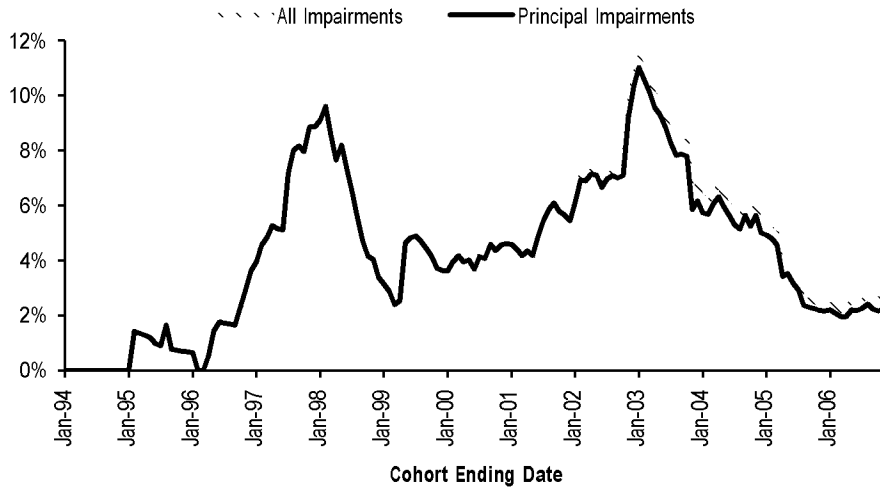


Figure 12

### Trailing 12-Month Speculative-Grade Impairment Rates

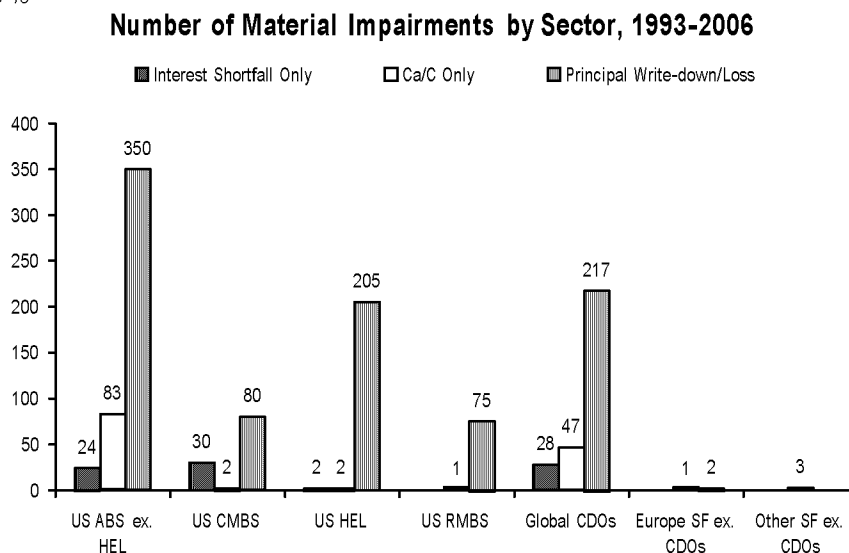


Note: Principal impairments refer to securities that sustained principal write-down/losses or were downgraded to Ca or C, whereas interest impairments are securities that experienced only interest shortfalls, both as of the end of 2006. Please see Appendix 1 for a glossary of terms.

## Lifetime Impairments as of 2006

As of the end of 2006, a total of 1,152 structured finance securities were materially impaired, representing roughly 1.8% of all 63,896 structured finance tranches studied in this report. The number of these impairments by major sectors and their current impairment status is shown in Figure 13.

Figure 13



Note: The "Principal Write-down/Loss" category includes any tranches that have experienced principal write-downs or principal losses that were not cured, regardless of whether they also experienced interest shortfalls or were downgraded to Ca/C. Some Ca/C-only securities may have experienced principal losses, but the loss data is not available to us. Securities that sustained principal write-downs or losses or were downgraded to Ca/C are called principal impairments. Please see Appendix 1 for a glossary of terms.

Figure 13 reveals that the US ABS sector experienced the largest number of impairments, while the global CDO sector had the second largest number of impairments, which is then followed by the HEL sector as the third largest.<sup>15</sup> Furthermore, the number of interest impairments to date has been reduced significantly over the past couple of years, as securities that had been impaired due to interest shortfalls either sustained principal losses (hence becoming principal-impaired) or were cured entirely.

By vintage, very few securities issued since 2003 have been impaired (Figure 14). By contrast, those issued during 1998-2001 were affected the most with 168, 187, 202, and 167 impairments, respectively, and the 1998 vintage experienced the highest lifetime impairment rate of 10%.

15. The number of RMBS and HEL impairments reported here differs from those reported in prior studies because some of the old vintage RMBS transactions sponsored by DLJ were reclassified into the HEL category. A Moody's Special Comment published in 2006 showed that these transactions were backed by subprime mortgage loans by today's standard. Please refer to Moody's Special Comment, "Deal Sponsor and Credit Risk of US ABS and MBS Securities," December 2006. Please also see the glossary for the definition of RMBS and HEL.

Figure 14

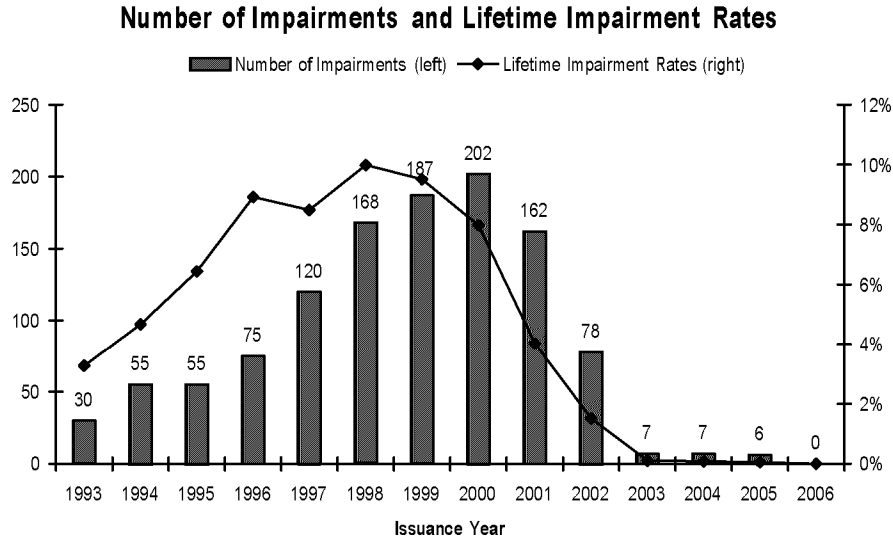
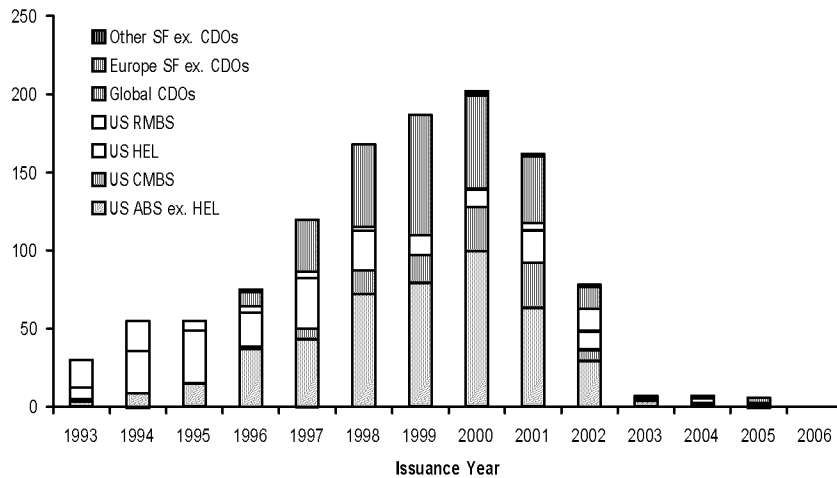


Figure 15 further depicts the distribution of impairments by sector across different vintages. Historically, CDO impairments were concentrated in four issuance years: 1998-2001, whereas most HEL impairments affected securities issued between 1994 and 1997.

It is important to note that the line between RMBS and HEL is often unclear. RMBS transactions issued prior to 1998 may include a substantial portion of low quality loans because prior to the rapid growth of the subprime mortgage industry, the market classified all securities backed by first-lien residential mortgages as RMBS, regardless of the credit quality of the borrower. In fact, the 36 RMBS impairments issued out of the 1993 and 1994 vintages may very well be backed by at least a substantial portion of subprime loans by today's standard, but this is difficult to confirm. In addition, the creation of the Alt-A loan product geared towards borrowers in between prime and subprime has further blurred the line between RMBS and HEL. For this reason, in later sections and the appendices, we will analyze the performance of the US RMBS and HEL sectors separately only for a more recent period after 1998, and the two sectors as a combined category for the entire study period.

Figure 15

### Number of Material Impairments by Sector and Issuance Year (as of 2006)



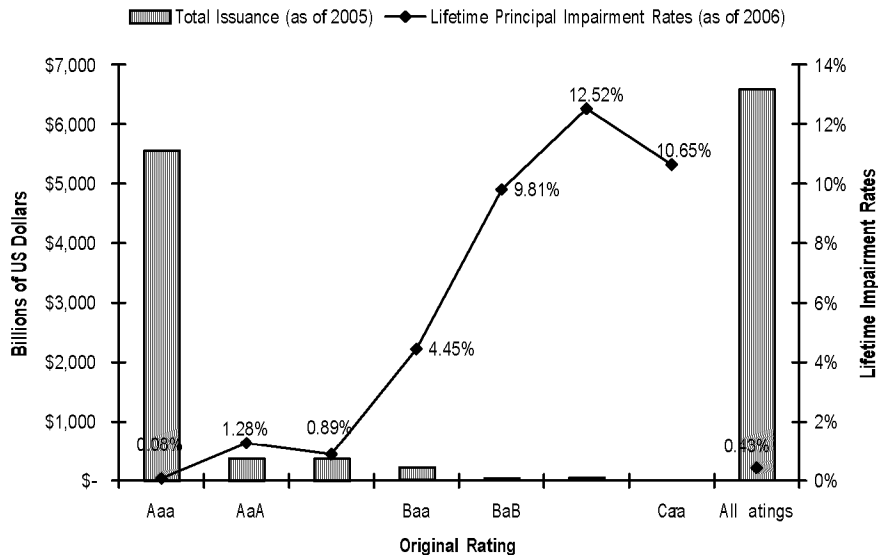
| Data for Figure 15 |                   |            |            |            |                |                       |                      |              |
|--------------------|-------------------|------------|------------|------------|----------------|-----------------------|----------------------|--------------|
| Issuance Year      | US ABS<br>ex. HEL | US<br>CMBS | US<br>HEL  | US<br>RMBS | Global<br>CDOs | Europe SF<br>ex. CDOs | Other SF<br>ex. CDOs | All SF       |
| 1993               | 4                 | 1          | 8          | 17         |                |                       |                      | 30           |
| 1994               | 9                 |            | 27         | 19         |                |                       |                      | 55           |
| 1995               | 15                |            | 34         | 6          |                |                       |                      | 55           |
| 1996               | 37                | 2          | 22         | 4          | 9              |                       | 1                    | 75           |
| 1997               | 43                | 7          | 32         | 5          | 33             |                       |                      | 120          |
| 1998               | 72                | 16         | 25         | 3          | 52             |                       |                      | 168          |
| 1999               | 79                | 18         | 13         |            | 77             |                       |                      | 187          |
| 2000               | 100               | 28         | 11         |            | 60             | 2                     | 1                    | 202          |
| 2001               | 63                | 29         | 21         | 5          | 43             |                       | 1                    | 162          |
| 2002               | 29                | 7          | 12         | 15         | 14             | 1                     |                      | 78           |
| 2003               | 4                 | 2          | 1          |            |                |                       |                      | 7            |
| 2004               | 2                 | 1          | 3          | 1          |                |                       |                      | 7            |
| 2005               |                   | 1          |            | 1          | 4              |                       |                      | 6            |
| 2006               |                   |            |            |            |                |                       |                      | 0            |
| <b>Total</b>       | <b>457</b>        | <b>112</b> | <b>209</b> | <b>76</b>  | <b>292</b>     | <b>3</b>              | <b>3</b>             | <b>1,152</b> |

The structured finance sector has traditionally been dominated by Aaa-rated securities. While the number of unique Aaa ratings (after excluding pari passu tranches) makes up about a third of all ratings, by dollar volume at the time of issuance, the Aaa category comprises almost 85% of all structured finance issuance. In particular, Figure 16 makes two noteworthy observations.

The first is that original ratings have differentiated lifetime impairment rates very well (except for the kink in the Aa category) in the sense that the impairment rates have been higher in lower rating categories. The second is that the structured finance sector as a whole has sustained a low lifetime impairment rate of merely 0.43%, weighted by dollar volume of issuance.

Figure 16

### Total Issuance and Lifetime Principal Impairment Rates by Dollar Volume



### Historical Impairment Correlations across Sectors

In the sections above and several prior special comments, we have highlighted some similarities and differences of credit performance across asset classes. For example, we have demonstrated that the US ABS sector (ex. HEL) and the CDO sector experienced poor performance during 1998-2001, whereas the US RMBS and US CMBS sectors have consistently outperformed during the entire study period. Additionally, during the last three years both US ABS and CDO securities have exhibited great performance.

Figure 17 depicts the impairment rate trends across major structured finance sectors as well as the default rate trend in the global corporate sector.<sup>16</sup> For the purpose of illustration, Figure 18 provides a historical correlation matrix of these impairment rates and default rates by sectors.

Figure 17

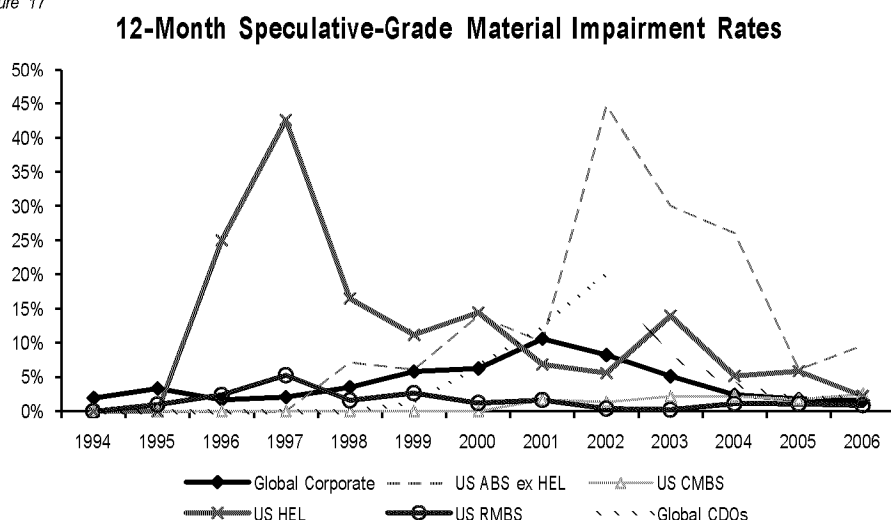


Figure 18

### Historical Speculative-Grade 12-Month Impairment Rate Correlations across Sectors

| Correlation Matrix, 1994-2006      | Global Corporate | US ABS ex HEL | US CMBS | US HEL | US RMBS | Global CDOs | Global Corporate (one-year lagged) |
|------------------------------------|------------------|---------------|---------|--------|---------|-------------|------------------------------------|
| Global Corporate                   | 100%             | 47%           | 11%     | -16%   | -14%    | 80%         | 71%                                |
| US ABS ex HEL                      | 47%              | 100%          | 56%     | -23%   | -44%    | 83%         | 89%                                |
| US CMBS                            | 11%              | 56%           | 100%    | -39%   | -41%    | 42%         | 34%                                |
| US HEL                             | -16%             | -23%          | -39%    | 100%   | 85%     | -22%        | -22%                               |
| US RMBS                            | -14%             | -44%          | -41%    | 85%    | 100%    | -35%        | -49%                               |
| Global CDOs                        | 80%              | 83%           | 42%     | -22%   | -35%    | 100%        | 91%                                |
| Global Corporate (one-year lagged) | 71%              | 89%           | 34%     | -22%   | -49%    | 91%         | 100%                               |

Figures 17 and 18 imply three notable observations.

First, the speculative-grade impairment rates in the US ABS excluding HEL and global CDO sectors were highly correlated (89% for ABS and 91% for CDOs) with the one-year -lagged speculative-grade default rate in the corporate sector. This suggests that corporate credit conditions exerted a strong impact on the credit performance of US ABS and global CDO securities. In addition, the impairment rates of US ABS and CDO tranches were also highly correlated with each other at 83%.

Second, the impairment rates of residential mortgage-backed securities were negatively correlated with those in other structured finance sectors and the corporate sector, but were positively correlated between themselves. For example, the impairment rate correlation was -44% between US RMBS and US ABS and -49% between US RMBS and corporate (one-year lagged), but the impairment rate correlation between US RMBS and US HEL was at 85%.

16. The trailing 12-month speculative-grade corporate default rates are from Moody's latest corporate default study, "Corporate Default and Recovery Rates, 1920-2006," February 2007.

Third, the impairment rate of US CMBS securities was positively correlated with those in the US ABS (ex. HEL), global CDO, and corporate sectors, but negatively correlated with US RMBS and US HEL. This suggests that the performance of commercial real estate loan-backed securities had been more sensitive to the corporate credit cycle than to the conditions of consumer credit and the residential housing markets.

While Figure 18 illustrates how the impairment rates across sectors were correlated, these correlation coefficients only represent what had happened in the past and future correlations across sectors may be different. For instance, the underlying collateral of CDOs has changed in the last few years from mainly corporate credits to structured finance credits. As a result, the future performance of CDO securities may be more correlated with those of other structured finance securities than that of corporate credits.

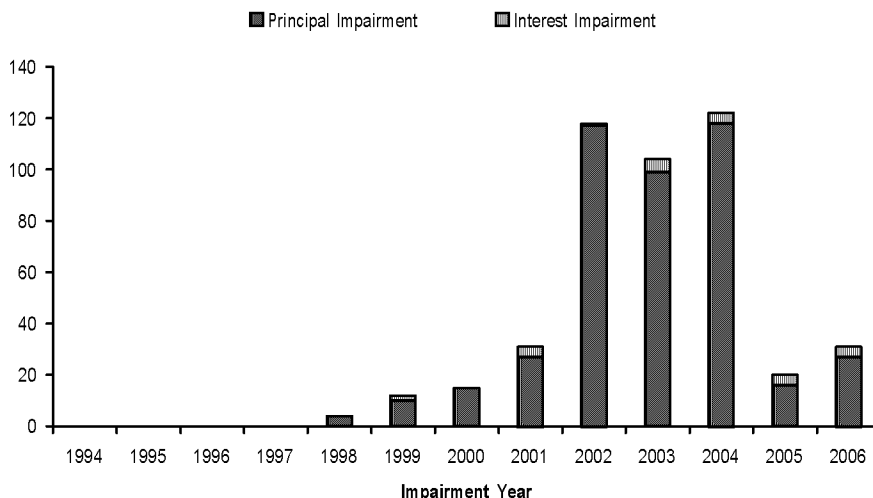
## SECTOR SPECIFIC ANALYSIS OF MATERIAL IMPAIRMENTS

### US ABS ex. HEL

The US ABS sector, excluding HEL, saw an increase in the number of newly impaired securities in 2006. The number of new principal impairments rose to 27 from 16 in the prior year and there were four new interest impairments, the same as in 2005. Despite the increases in impairments, the total new US ABS impairments remained well below the high levels seen during 2002-2004 and comparable to those observed before 2002 (Figure 19). Moreover, the US ABS impairment rate for 2006 was about 1.0%, slightly higher than the rate of 0.7% in 2005.

Figure 19

### Number of US ABS (ex. HEL) Impairments by Impairment Year



Note: Principal impairments refer to securities that sustained principal write-down/losses or were downgraded to Ca or C, whereas interest impairments are securities that experienced only interest shortfalls, both as of the end of 2006. Please see Appendix 1 for a glossary of terms.

By asset class, the troubled manufactured housing (MH), franchise loan and equipment lease ABS categories continued to produce more new impairments in 2006, as they did in 2005. Specifically, there were eleven new MH impairments, three new franchise loan impairments, and three new equipment lease impairments (Figure 20).

Figure 20

**2006 US ABS (ex. HEL) New Impairments by Asset Class, Compared to Their Historical Totals**

| Impaired ABS Asset Classes  | 2006 New Impairments and Impairment Rate |   |                 | Lifetime Impairments and Impairment Rates (by share of ratings) |  |                          | Lifetime Impairments and Impairment Rates (by share of original balance in millions of US dollars) |                                   |                          |
|-----------------------------|--|---|-----------------|---|--|--------------------------|--|-----------------------------------|--------------------------|
|                             | Number of impairments                    | Number of Ratings Outstanding on 1/1/2006 | Impairment Rate | Total Number of Impairments (as of 12/31/2006)                  | Total Number of Ratings (as of 12/31/2005) | Lifetime Impairment Rate | Impairment Volume (as of 12/31/2006)   | Total Issuance (as of 12/31/2005) | Lifetime Impairment Rate |
| Automobiles - Subprime      | 0  | 46  | 0.00%           | 9   | 149  | 6.04%                    | 197  | 21,406                            | 0.92%                    |
| Credit Card - Bank          | 0  | 601                                       | 0.00%           | 5   | 1,467                                      | 0.34%                    | 229  | 642,007                           | 0.04%                    |
| Credit Card - Retail        | 0  | 105                                       | 0.00%           | 6   | 230  | 2.61%                    | 711  | 81,059                            | 0.88%                    |
| Franchise Loans             | 3  | 93  | 3.23%           | 61  | 164  | 37.20%                   | 1,265  | 6,487                             | 19.49%                   |
| Health Care Receivables     | 0  | 5   | 0.00%           | 26  | 32   | 81.25%                   | 3,350  | 3,742                             | 89.52%                   |
| Leases - Aircraft           | 0  | 69  | 0.00%           | 17  | 103  | 16.50%                   | 2,349  | 33,295                            | 7.05%                    |
| Leases - Equipment          | 3  | 69  | 4.35%           | 36  | 241  | 14.94%                   | 500  | 27,424                            | 1.82%                    |
| Leases - Small-Ticket       | 0  | 31  | 0.00%           | 3   | 65   | 4.62%                    | 3  | 6,437                             | 0.05%                    |
| Manufactured Housing - Term | 11                                       | 428                                       | 2.57%           | 269   | 797  | 33.75%                   | 6,457  | 61,797                            | 10.45%                   |
| Mutual Fund Fees            | 14                                       | 32  | 43.75%          | 14  | 37   | 37.84%                   | 550  | 3,244                             | 16.97%                   |
| Other ABS                   | 0  | 1,500                                     | 0.00%           | 1   | 2,560                                      | 0.04%                    | 85   | 1,337,871                         | 0.01%                    |
| Recreational Vehicles       | 0  | 27  | 0.00%           | 3   | 68   | 4.41%                    | 33   | 8,840                             | 0.37%                    |
| Small Business Loans        | 0  | 181                                       | 0.00%           | 4   | 207  | 1.93%                    | 12   | 14,526                            | 0.08%                    |
| Trucks                      | 0  | 23  | 0.00%           | 3   | 63   | 4.76%                    | 41   | 12,680                            | 0.33%                    |
| US ABS ex. HEL              | 31                                       | 3,210                                     | 0.97%           | 457   | 6,183                                      | 7.39%                    | 15,781   | 2,260,816                         | 0.70%                    |

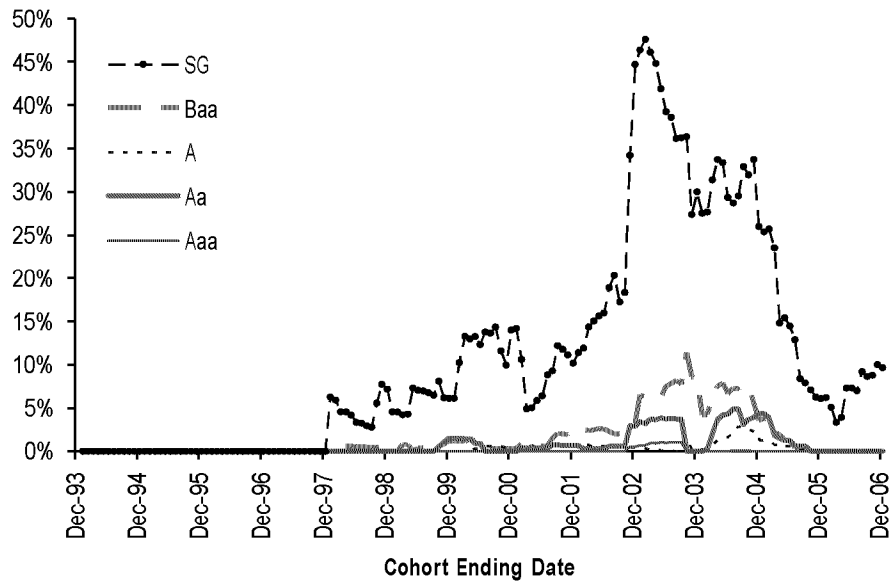
The other 14 new impairments in the US ABS sector were mutual fund fee-backed securities, most of which had already been deeply downgraded in 2002 due to the sharp and sustained decline of stock prices. These transactions securitized deferred mutual fund fee charges, commonly known as "B" share fees or "12b-1" fees, and most were issued through FEP Holdings, an affiliate of the seller, Constellation Financial Management. As of May 2006, all impaired tranches carried a Ca or C rating, making this ABS asset class among the worst performing ones in the ABS sector.

Figure 21 depicts the trends of trailing 12-month ABS impairment rates by rating outstanding at the cohort formation date during 1993-2006. The figure shows that the impairment rates in the US ABS sector have declined substantially across all rating categories, and only the speculative-grade impairment rate has increased recently.



Figure 21

### Trailing 12-Month Impairment Rates by Rating: US ABS ex. HEL



Recall in Figure 15, we showed that the credit performance of US ABS securities has varied significantly across vintages. In addition, in several prior reports we have demonstrated that there is a seasoning pattern of impairments in structured finance, as securities typically do not become impaired in the first two years of their lives. Figure 22 depicts this seasoning pattern of cumulative impairment rates in the US ABS (ex. HEL) sector. As the figure shows, on average, the Baa cumulative impairment rates rose significantly to 6.8% within three years after issuance from 1.8% in two years, and the increase was particularly evident among those issued in 2000 and 2001.

By comparison, the cumulative impairment rates of speculative-grade ABS securities tend to be more front-loaded, as expected, than those in the Baa category. The average speculative-grade cumulative impairment rate jumped to 12.7% in just two years after issuance from 1.8% after the first year.

Figure 22

**Baa Cumulative Impairment Rates for Selected Vintages: US ABS (ex. HEL)**

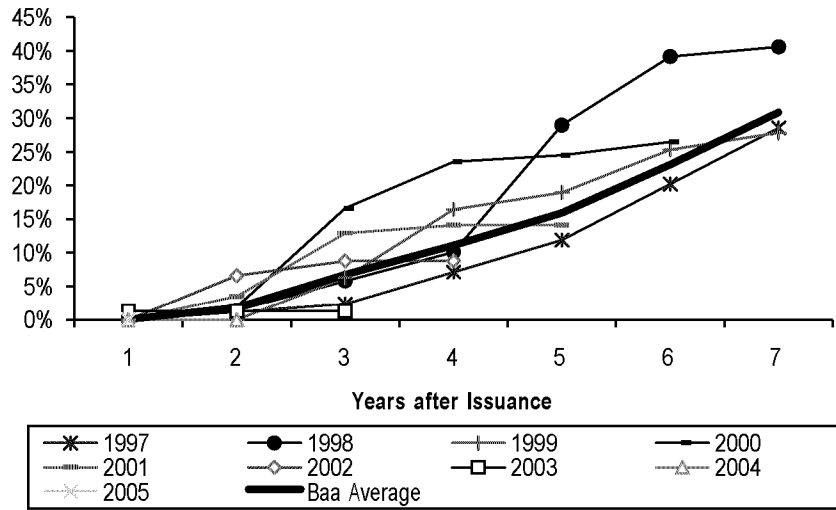
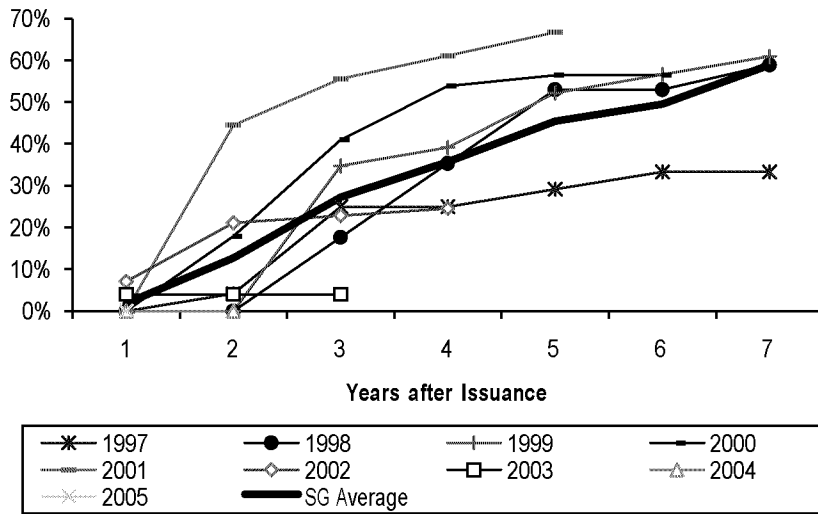


Figure 23

**SG Cumulative Impairment Rates for Selected Vintages: US ABS (ex. HEL)**



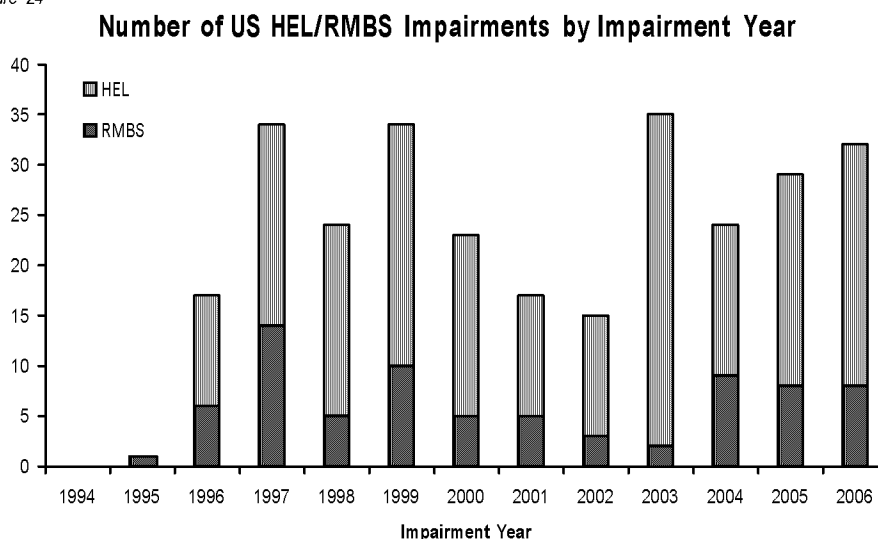
Note: "Baa Average" and "SG Average" represent the historical average cumulative impairment rate for Baa-rated and speculative-grade securities during the entire study period. These historical averages have been adjusted for withdrawn ratings, as we do in the appendix tables, whereas the vintage-based impairment rates in the chart are not adjusted for WRs.

## US HEL and RMBS

Out of a total of 10,927 HEL tranches outstanding at the beginning of 2006, 24, or 0.22%, were newly impaired in 2006. 15 of the 24 HEL impairments were issued either in 2001 or 2002. Although this marks a small increase over the total of 21 impairments in 2005, the 0.22% one-year impairment rate in 2006 compares favorably to that of 0.33% in 2005.

Meanwhile, out of a total of 8,249 US RMBS securities outstanding at the start of the year, eight new impairments were observed in 2006, which is exactly the same number seen in the previous year (Figure 24). Six of the eight RMBS impairments were issued in 2002. All but one of the 24 HEL impairments and all 8 RMBS impairments sustained principal losses or were downgraded to Ca or C, and hence, were principal-impaired.

Figure 24



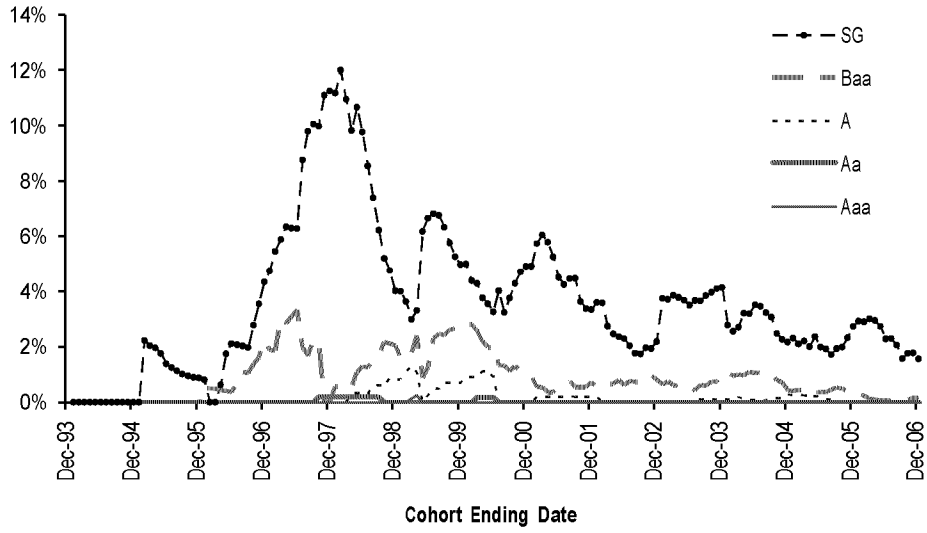
To date, the HEL sector has witnessed 209 impairments (all but two were principal-impaired). This total amounts to 1.7% of all securities issued during 1993-2005, or 0.19% by total dollar volume of issuance. In the US RMBS sector, the total number of impairments to date now stands at 76 (all principal impaired) and this represents 0.67% of all 11,312 securities or 0.03% by total dollar volume of issuance.

Figure 25 plots the trends of trailing 12-month impairment rates by rating outstanding at the cohort formation date during 1993-2006. The first chart in Figure 25 combines US RMBS and HEL into one category and the second and third charts present the trends in the two sectors separately. We combined the two sectors into one category for some of the figures in this report because (1) the two sectors have similar collateral (both mainly backed by residential mortgages), and (2) the definition of RMBS and HEL has changed according to the evolution of these terms in the general marketplace.<sup>17</sup> From the figure we see that the impairment rates in the US RMBS and HEL sector have remained low among securities rated Baa or above, and declined in recent years. Moreover, most RMBS and HEL impairments occurred prior to 2000. More impairment rate data also appear in the Appendices.

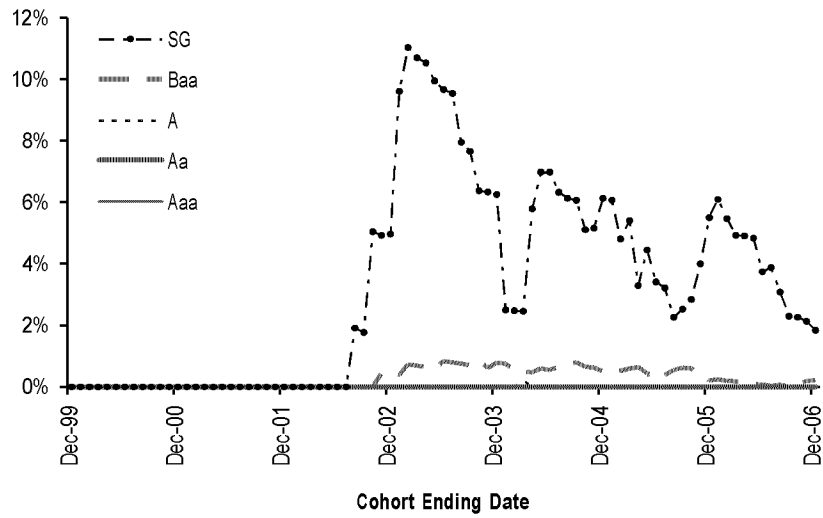
17. Prior to 1998, RMBS collateral was generally defined as first-lien residential mortgages, regardless of the credit quality of the borrower, while HEL collateral generally included junior liens such as HELOCs or closed-end seconds. However, as subprime lending became more prevalent, the market shifted its definition such that HEL encompassed subprime first-lien residential mortgages while RMBS included first-lien mortgages made to higher quality borrowers. Since 1998 and especially in the last five years, a deal classified as RMBS by Moody's is generally backed by prime or Alt-A quality first-lien residential mortgages, while a deal classified as HEL can be backed by subprime first-lien mortgages or junior liens. Therefore, a subprime deal which would be classified as HEL today may have been classified as RMBS in the past.

Figure 25

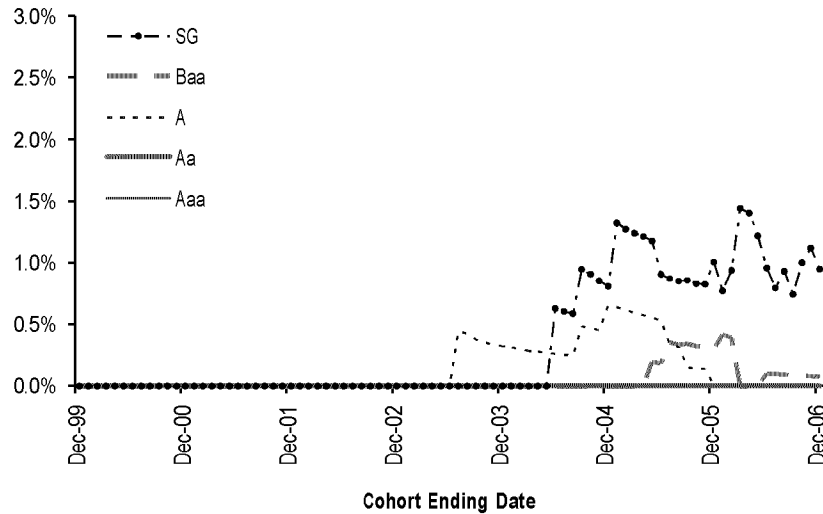
### Trailing 12-Month Impairment Rates by Rating: US HEL & RMBS Combined



### Trailing 12-Month Impairment Rates by Rating: US HEL (post-1998 vintages only)



**Trailing 12-Month Impairment Rates by Rating:  
US RMBS (post-1998 vintages only)**



The second and third chart in Figure 25 examines the US HEL and RMBS sectors separately, but only includes securities issued after 1998 due to the change in the definition of HEL and RMBS.<sup>18</sup> As the two charts show, the 12-month impairment rates have been markedly lower in the RMBS sector than in the HEL sector. Although there were a small number of impairments in 2006 that were rated Baa at the start of the year, the overall Baa impairment rate was 0.08% for US RMBS and 0.22% for US HEL in the latest 12-month cohort.

In Figures 26 and 27, we examine the seasoning variations of impairment rates by vintage separately for Baa-rated and speculative-grade rated securities.<sup>19</sup> There are several interesting observations that can be made.

First, the speculative-grade average cumulative impairment rate increased substantially in the third year, rising from 1.1% to 4.9%, sooner than that in the Baa category, which started its significant increase in the fourth year after issuance, driving the cumulative impairment rate from 1.1% within three years from issuance to 4.6% after four years.<sup>20</sup> In addition, among US HEL securities, the increases in the Baa impairment rates were particularly marked in both the fifth and sixth years as recent impairments mainly involved the 1999 and 2000 vintages.

Second, among Baa-rated HEL/RMBS securities, those issued in 1997 experienced a seven-year cumulative impairment rate of 14.3%, higher than both the 11.1% average Baa impairment rate and the average impairment rates among those issued between 1998 and 2001. The Baa securities issued in 2002 appeared to be greatly outperforming the average, whereas the cumulative impairment rates of those issued in 2000 and 2001 were similar to the historical average.

Third, among speculative-grade HEL/RMBS securities, those issued in 1999 experienced much higher impairment rates than the historical average seven-year impairment rate of 17.1%. It should be noted that in the HEL and RMBS combined category, there were just 26 speculative-grade securities in the entire year 1999. In addition, for speculative-grade HEL securities issued after 1998, the average seven year impairment rate was 24.3%, much higher than the 3.8% average seven year impairment rate for speculative-grade RMBS securities issued after 1998 (not shown separately in the figures due to the small number of impairments in this category).

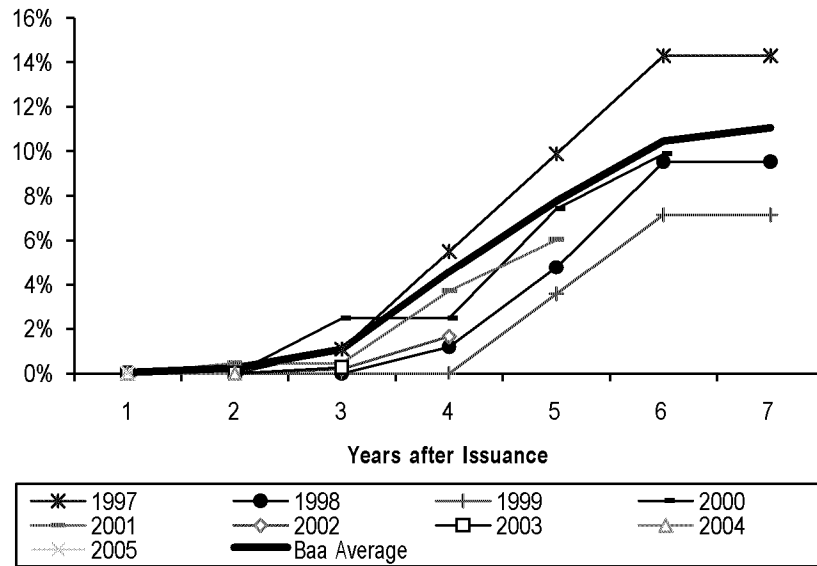
18. Please see the glossary in the Appendix for definitions of terms.

19. Among HEL securities issued before 2004 and RMBS securities issued between 1998 and 2000, the number of speculative-grade securities is less than 30.

20. Some of the differences in the timing of impairments across rating categories and transactions may be attributable to structural differences.

Figure 26

### Baa Cumulative Impairment Rates for Selected Vintages: US HEL/RMBS



### Baa Cumulative Impairment Rates by Vintage: US HEL (post-1998 vintages only)

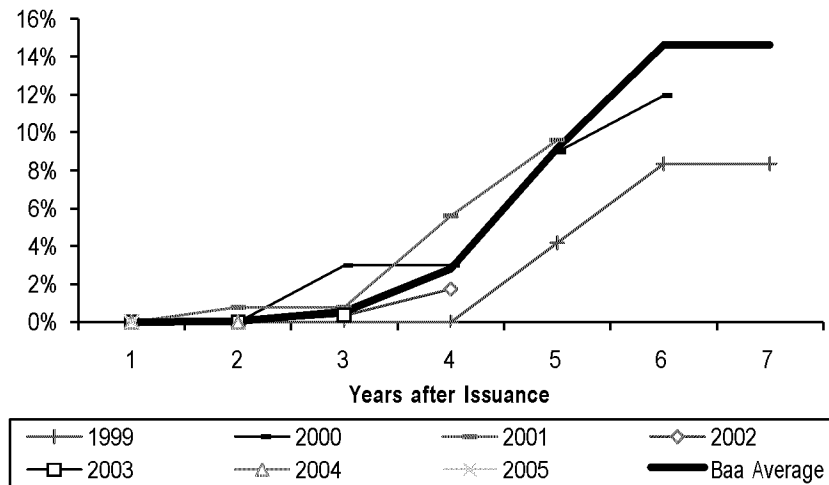
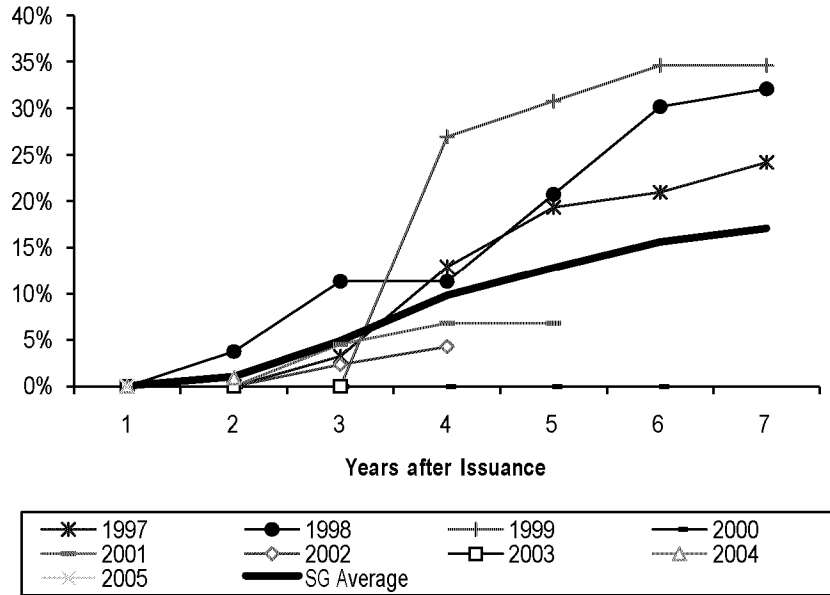
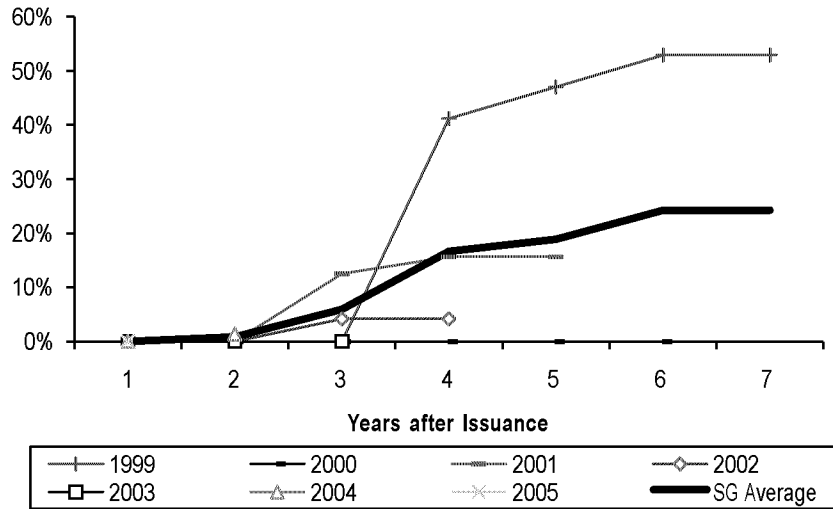


Figure 27

### SG Cumulative Impairment Rates for Selected Vintages: US HEL/RMBS



### SG Cumulative Impairment Rates by Vintage: US HEL (post-1998 vintages only)

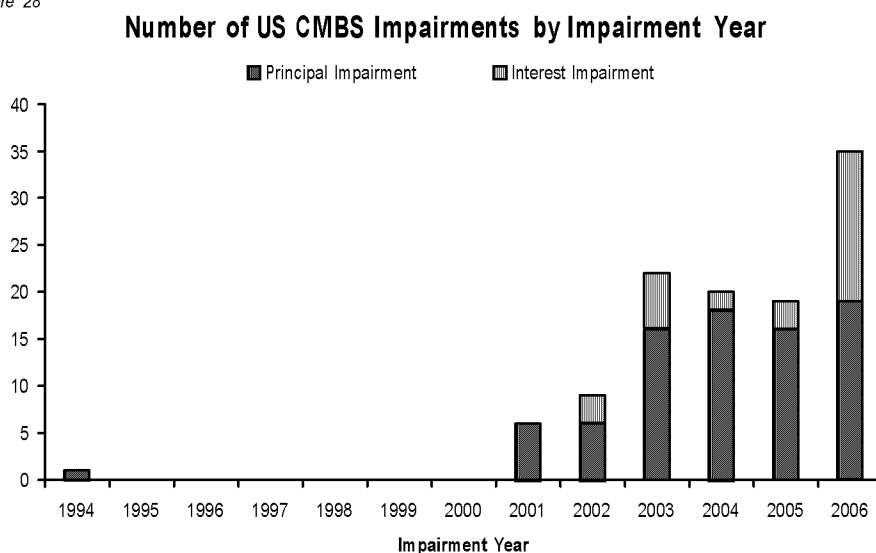


Note: Baa Average and "SG Average" represent the historical average cumulative impairment rate for Baa-rated and speculative-grade securities during the entire study period. These historical averages have been adjusted for withdrawn ratings, as we do in the appendix tables, whereas the vintage-based impairment rates in the chart are not adjusted for WRs.

## US CMBS

Out of a total of 4,378 US CMBS tranches outstanding at the beginning of 2006, 35 tranches were impaired for the first time in 2006.<sup>21</sup> Of these, 16 were interest impairments and 19 were principal impairments (Figure 28). Since CMBS interest impairments have been frequently cured in the past, we expect the majority of the 16 interest impairments to be cured.<sup>22</sup> Consequently, the credit performance of the US CMBS sector in 2006 should be largely similar to that in 2005.

Figure 28



*Note: Principal impairments refer to securities that sustained principal write-down/losses or were downgraded to Ca or C, whereas interest impairments are securities that experienced only interest shortfalls, both as of the end of 2006. Please see Appendix 1 for a glossary of terms.*

As we reported in Figures 9 and 10, all the 2006 new CMBS impairments in 2006 were rated Ba or below. The 12-month speculative-grade CMBS impairment rate rose to 2.53% in 2006 from 1.77% in the prior year, whereas the 12-month investment-grade impairment rate remained zero almost for the entire year 2006 (Figure 29).

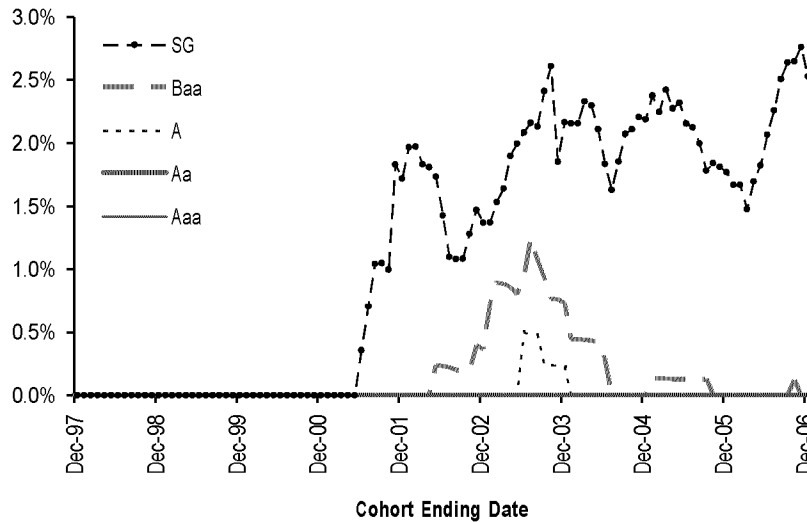
21. CRE CDOs are included in this sector.

22. For example, we reported 32 new impairments in the US CMBS sector in 2005. As of the end of 2006, 13 (all interest impaired tranches) were fully cured.



Figure 29

**Trailing 12-Month Impairment Rates by Rating: US CMBS**



By vintage, Baa securities issued in 2000 were affected the most by impairments, and none issued since 2003 have been impaired (Figure 30). Additionally, the average five-year Baa cumulative impairment rate at 1.3% ranks the lowest among similarly rated securities across all structured finance sectors.

Figure 30

**Baa Cumulative Impairment Rates for Selected Vintages: US CMBS**

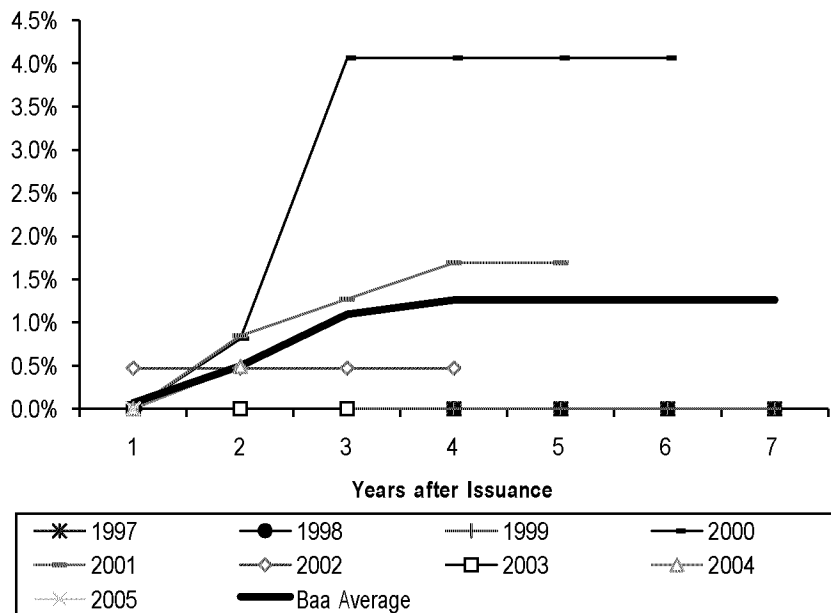
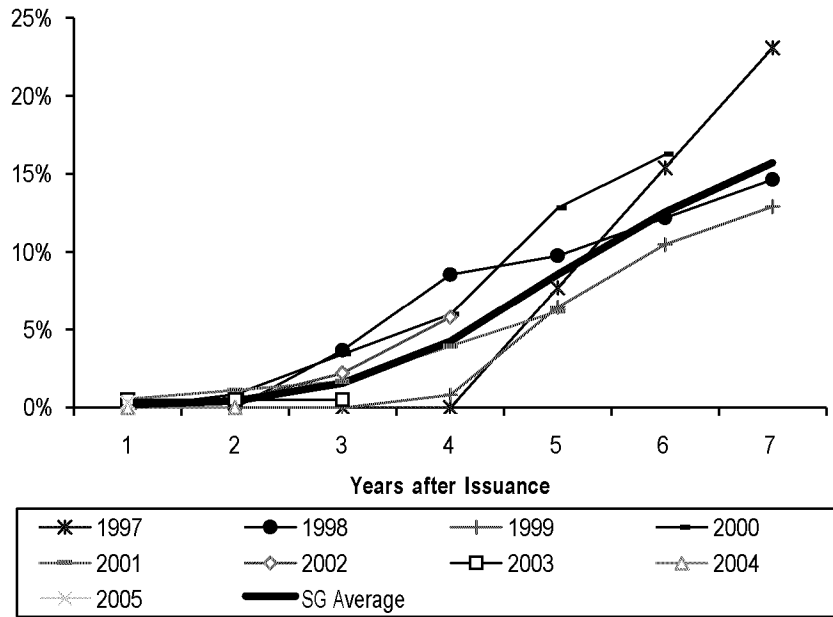


Figure 31

**SG Cumulative Impairment Rates for Selected Vintages: US CMBS**



Note: "Baa Average" and "SG Average" represent the historical average cumulative impairment rate for Baa-rated and speculative-grade securities during the entire study period. These historical averages have been adjusted for withdrawn ratings, as we do in the appendix tables, whereas the vintage-based impairment rates in the chart are not adjusted for WRs.

Figure 31 compares the speculative-grade cumulative impairment rates of various CMBS vintages. Within four years after issuance, those issued in 1998, 2000, and 2002 appeared to have underperformed the average. The high seven-year speculative-grade impairment rate of 23% for the 1997 vintage was the result of a small sample - there were just 26 securities in the category.

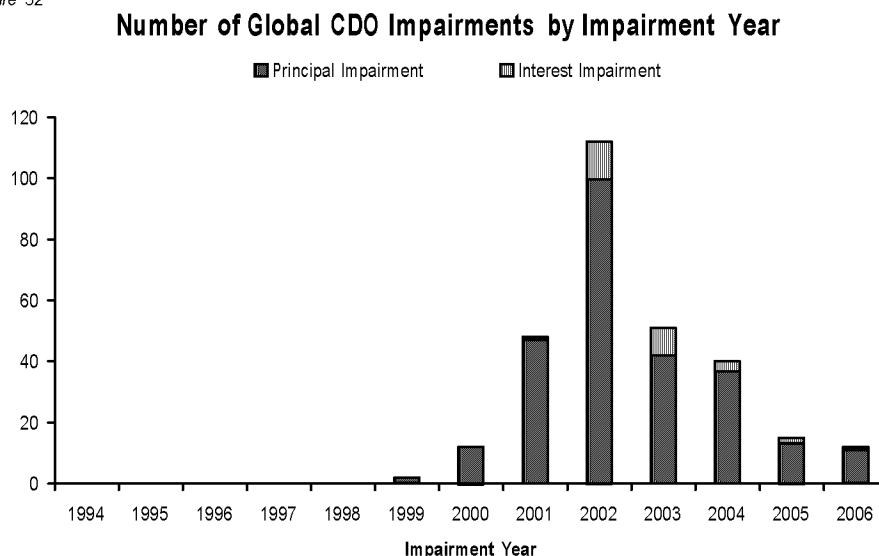
Figure 31 also shows that the speculative-grade 7-year cumulative impairment rates averaged 15.7%, which was similar to the average 7-year impairment rate of 17.1% in the combined RMBS/HEL category. Furthermore, the speculative-grade CMBS impairment rates did not markedly increase until the fourth year after issuance, more than one and a half year later than those in the combined RMBS and HEL sector (see Figure 27).

## Global CDOs

2006 was another banner year for global CDOs with just 12 newly impaired tranches, which is even lower than the total of 15 impairments in 2005 (Figure 32). Eight of the 12 new impairments belonged to the high yield CBO and CLO categories, and were issued during 1997-1999. Three new impairments involved CDOs of structured finance securities issued in 2000 and 2002 (Figure 33). The remaining new impairment was Class IV of a balance sheet cash flow transaction, Project Funding Corporation I, which was backed by a static portfolio of project finance loans, issued in 1998, and was downgraded to C in 2006.<sup>23</sup>

The small number of impairments coupled with strong growth drove the sector's 12-month impairment rate down to a historical low of 0.29% from 0.35% the year prior (Figure 34).<sup>24</sup> Furthermore, the impairment rate of investment-grade CDO securities remained close to zero for all 12-month cohorts ending in 2006. Continuing the trend of cures in the CDO sector, 16 previously impaired CDO tranches cured their interest shortfalls in 2006. To date, 45 or 23% of the 196 interest-impaired HYCBO tranches have been cured thanks to very low default rates and high recovery rates in the corporate sector in the last couple of years. Additionally, five Ca/C-rated tranches were paid in full and another two were upgraded out of the Ca/C category with no outstanding shortfalls or losses; therefore, these seven impaired securities were also cured in 2006, bringing the total of cures on Ca/C-rated CDO securities to nine. As the interest-impaired tranches were gradually cured, an overwhelming majority of materially impaired CDO tranches to date either had sustained principal losses or remained in the Ca/C rating category.

Figure 32



Note: Principal impairments refer to securities that sustained principal write-down/losses or were downgraded to Ca or C, whereas interest impairments are securities that experienced only interest shortfalls, both as of the end of 2006. Please see Appendix 1 for a glossary of terms.

23. According to Moody's rating action reports on this deal, the largest of the loans in the portfolio suffered a default in the payment of principal due at the end of March 2006. The rating action reflected uncertainty about the amount and timing of the recovery on that loan. Moody's noted that this default triggered a "Subordination Event" such that collections had begun to be distributed to the notes sequentially. Moody's also noted that, since the transaction closed in 1998, the outstanding amount of the notes (initially U.S. \$617,000,000) had been reduced by approximately U.S. \$566,000,000.

24. CRE CDOs are not included in this sector.

Figure 33

**2006 Global CDO New Impairments, Compared to Their Historical Totals**

| Impaired CDO Asset Classes | 2006 New Impairments and Impairment Rate |   |                 | Lifetime Impairments and Impairment Rates (by share of ratings) |  |                          | Lifetime Impairments and Impairment Rates (by share of original balance in millions of US dollars) |                                   |                          |
|----------------------------|--|---|-----------------|---|--|--------------------------|--|-----------------------------------|--------------------------|
|                            | Number of Impairments                    | Number of Ratings Outstanding on 1/1/2006 | Impairment Rate | Total Number of Impairments (as of 12/31/2006)                  | Total Number of Ratings (as of 12/31/2005) | Lifetime Impairment Rate | Impairment Volume (as of 12/31/2006)   | Total Issuance (as of 12/31/2005) | Lifetime Impairment Rate |
| Balance Sheet Cash Flow    | 1  | 120                                       | 0.83%           | 2   | 225  | 0.89%                    | 46   | 77,749                            | 0.06%                    |
| Balance Sheet Synthetic    | 0  | 202                                       | 0.00%           | 17  | 365  | 4.66%                    | 1,806  | 38,824                            | 4.65%                    |
| Emerging Market            | 0  | 38  | 0.00%           | 1   | 96   | 1.04%                    | 34   | 6,737                             | 0.50%                    |
| High Yield CBO             | 5  | 391                                       | 1.28%           | 171   | 649  | 26.35%                   | 5,892  | 54,350                            | 10.84%                   |
| High Yield CLO             | 3  | 1,492                                     | 0.20%           | 16  | 1,678                                      | 0.95%                    | 856  | 143,677                           | 0.60%                    |
| Investment Grade CBO       | 0  | 125                                       | 0.00%           | 6   | 152  | 3.95%                    | 141  | 14,234                            | 0.99%                    |
| Structured Finance CDO     | 3  | 1,751                                     | 0.17%           | 61  | 1,935                                      | 3.15%                    | 1,276  | 195,223                           | 0.65%                    |
| Synthetic Arbitrage        | 0  | 1,225                                     | 0.00%           | 18  | 1,408                                      | 1.28%                    | 148  | 67,515                            | 0.22%                    |
| Other CDOs                 | 0  | 540                                       | 0.00%           | 0   | 787  | 0.00%                    | 0  | 99,615                            | 0.00%                    |
| All CDOs                   | 12                                       | 5,884                                     | 0.20%           | 292   | 7,295                                      | 4.00%                    | 10,198   | 697,923                           | 1.46%                    |

Figure 34

**Trailing 12-Month Impairment Rates by Rating: Global CDOs**

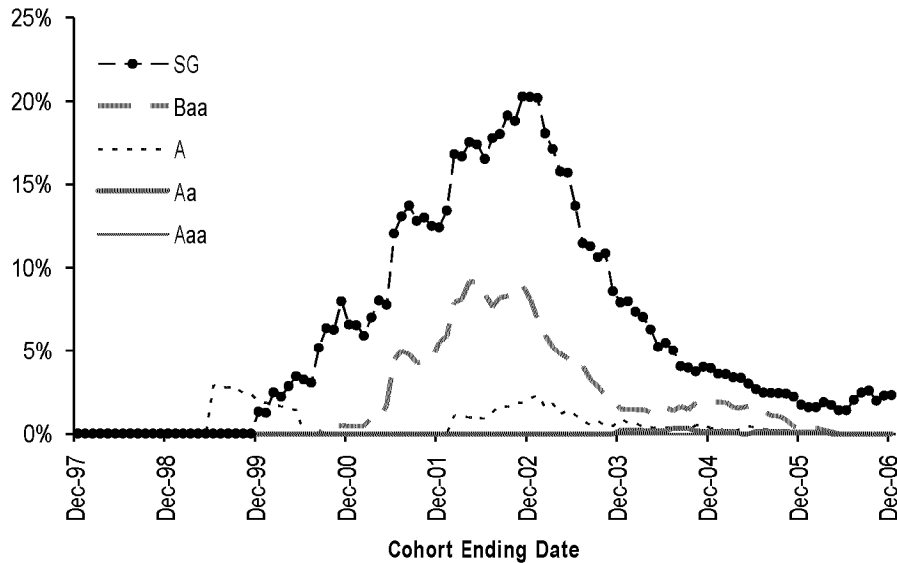
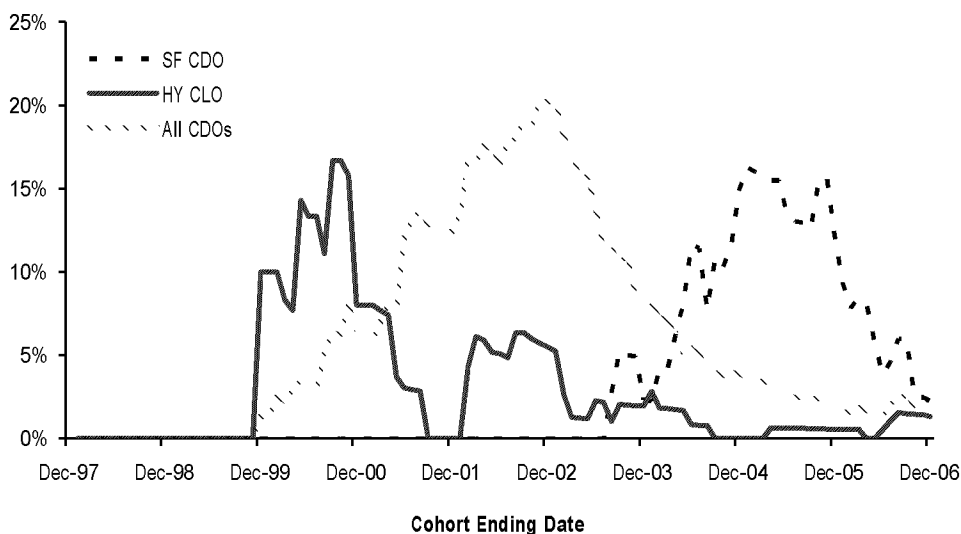


Figure 33 also reports the lifetime impairment rates in different CDO categories by share of securities and by share of original balance (US dollar-denominated tranches only). Specifically, the lifetime impairment rate by original balance is just 0.60% for HY CLOs and 0.65% for structured finance CDOs. Note that in the last two or three years, HY CLOs and SF CDOs have grown exponentially, accounting for roughly 21% and 28% of all US dollar-denominated CDO issuance.

Figure 35 further examines the impairment rate trends in the HY CLO and SF CDO deal categories. As shown, most of the speculative-grade impairments in the HY CLO category occurred before 2003 (most were issued in 1998), and the category's impairment rate has consistently been below the average impairment rate of all CDOs since 2001. By comparison, SF CDOs experienced high impairment rates in 2004 and 2005 (most were issued in 2000 and 2001, and some were in 2002), but have since fallen dramatically to below 3%.<sup>25</sup>

Figure 35

### Trailing 12-Month Speculative-Grade Impairment Rates by Selected CDO Deal Type



By vintage, excluding HYCBOs, Baa securities issued in 2000 and 2001 and 1998 underperformed the average, whereas those issued before 1998 and after 2001 have outperformed (Figure 36). The average Baa impairment rate increased markedly from 1.8% three years after issuance to 7.5% after four years, and peaked in year 5 at 10.8%.

Among securities rated speculative-grade at issuance, the 1997 and 1998 vintages performed the worst, and, like Baa tranches, those speculative-grade tranches issued since 2002 have experienced low impairment rates. Additionally, the seasoning pattern of CDO (ex. HYCBOs) impairment rates appears to be similar between the Baa and speculative-grade categories as the impairment rates in both rating categories increased markedly in the third and fourth years before reaching their peaks roughly around the fifth or sixth year.

25. In addition to some of the poor performing SF CDO transactions issued in 2000 and 2001 that were backed by ABS securitizations of manufactured housing loans, franchise loans, and equipment leases, some recently issued structured finance CDOs may also underperform due to the deterioration in performance of some subprime mortgage-backed securities in the CDO collateral pools. Please see Moody's Structured Finance Special Report, "The Impact of Sub-Prime Residential Mortgage-Backed Securities on Moody's-Rated Structured Finance CDOs: A Preliminary Review," March 23, 2007.

Figure 36

**Baa Cumulative Impairment Rates for Selected Vintages:  
Global CDOs ex. HYCBOs**

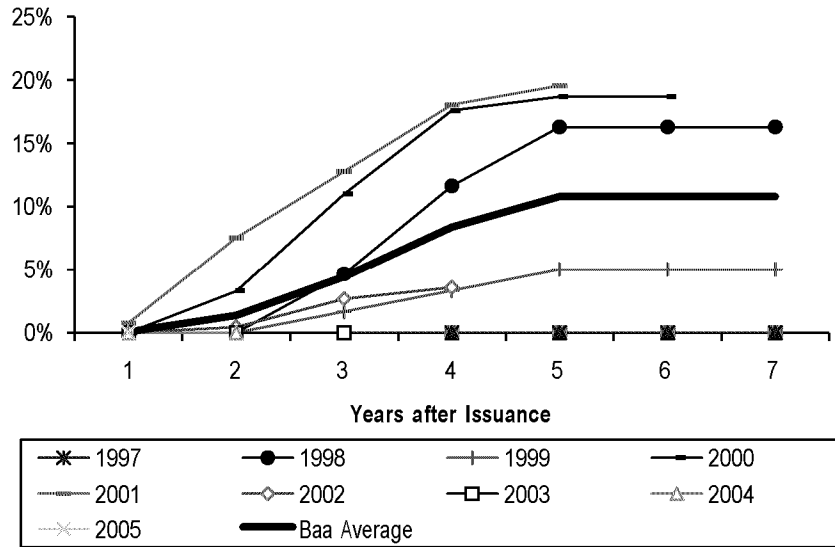
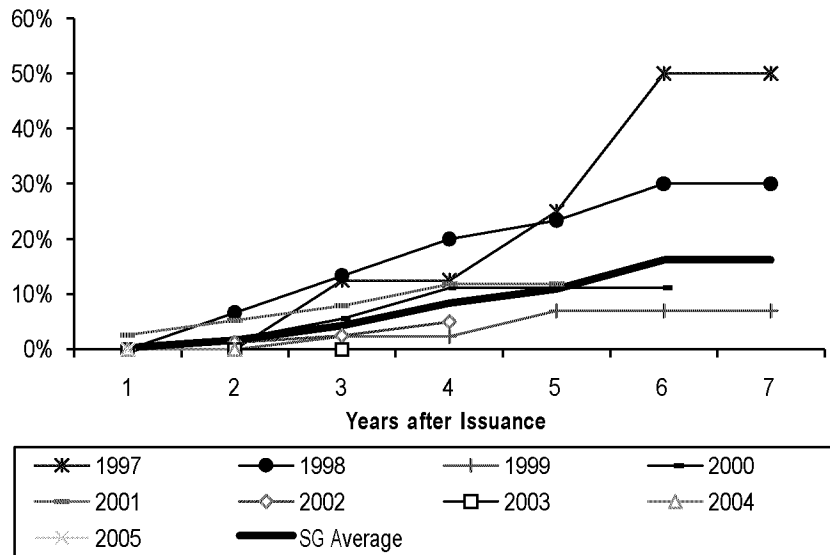


Figure 37

**SG Cumulative Impairment Rates for Selected Vintages:  
Global CDOs ex. HY CBOs**



Note: "Baa Average" and "SG Average" represent the historical average cumulative impairment rate for Baa-rated and speculative-grade securities during the entire study period. These historical averages have been adjusted for withdrawn ratings, as we do in the appendix tables, whereas the vintage-based impairment rates in the chart are not adjusted for WRs.

## LOSS-GIVEN-DEFAULT ON PRINCIPAL-IMPAIRED TRANCHES AND HISTORICAL AVERAGE LOSS RATES

This section presents analysis of loss severity rates, also known as loss-given-default (LGD) rates, and combines information on loss severity rates with data on material impairment rates to derive cumulative loss rates. Estimating expected final LGD on impaired structured finance securities is particularly challenging because most securitizations are structured as pass-through securities, and market prices are rarely available for structured securities in default. In previous research, we developed models to estimate final LGD for impaired tranches backed by residential mortgage collateral and for impaired collateralized bond obligations. In 2006, we developed a final LGD projection model for impaired manufactured housing ABS securities.<sup>26</sup> In this report, we update all these projections and derive estimated aggregate loss rates by sector and by rating.

Moody's regularly updates the payment and loss records of impaired structured finance securities. For each tranche, we are able to calculate the present value of losses (to date) using coupon rate as discount rate. For many tranches, the loss rate to date is effectively the final loss severity because their balances have been written down to zero (called "resolved" impairments in this report and "matured" impairments in prior reports). Many impaired tranches, however, have positive balances outstanding at the end of the study period and potential sources of future cash distributions to investors; hence, their expected final loss severity rates need to be estimated.

Although an overwhelming majority of impaired structured securities are currently principal-impaired, some are still experiencing only interest shortfalls. Due to the higher probability of cure for interest-impaired securities than principal-impaired securities and the greater challenges in forecasting losses for interest-impaired securities, in this report we will calculate and provide loss severity rates on principal-impaired securities only and exclude the projected final loss severity rates on interest impairments.

### LGD for All Resolved Impairments

We first examine a total of 425 resolved impairments that had suffered principal losses in structured finance overall. Resolved impairments are defined to be securities whose balances were either partially or completely written down to zero and their final LGD known by the end of 2006. All other impaired securities are called "unresolved" impairments. Our present data sample consists of 425 resolved principal impairments and 643 unresolved principal impairments. Figure 38 provides descriptive statistics regarding the realized final LGD rates of all resolved impairments. LGD rates both as a share of both original balance and impairment-date balance (the principal balance at the time of impairment) are reported.

Figure 38  
**Realized Final LGD Rates by Rating for All Resolved Principal Impairments in the All Structured Finance Category, 1993-2006**

| By original rating (% of original balance) |        |       |        |         | By rating at impairment (% of impairment-date balance) |        |       |        |         |
|--|--------|-------|--------|---------|--|--------|-------|--------|---------|
|  | Counts | Mean  | Median | Std Dev |  | Counts | Mean  | Median | Std Dev |
| Aaa  | 16     | 47.8% | 75.0%  | 36.2%   | Aaa  | 0      | NA    | NA     | NA      |
| Aa   | 29     | 59.6% | 73.8%  | 41.1%   | Aa   | 1      | 2.8%  | 2.8%   | NA      |
| A  | 35     | 55.0% | 68.7%  | 29.1%   | A  | 16     | 67.5% | 75.0%  | 27.6%   |
| Baa  | 167    | 49.9% | 55.0%  | 28.6%   | Baa  | 80     | 70.4% | 94.8%  | 37.3%   |
| Ba   | 99     | 52.1% | 58.6%  | 31.9%   | Ba   | 101    | 72.2% | 93.4%  | 34.1%   |
| B  | 76     | 60.3% | 69.2%  | 27.4%   | B  | 119    | 73.6% | 93.5%  | 33.8%   |
| Caa  | 3      | 82.0% | 84.8%  | 5.7%    | Caa  | 108    | 76.7% | 92.5%  | 30.7%   |
| Investment Grade                           | 247    | 51.6% | 63.3%  | 30.8%   | Investment Grade                                       | 97     | 69.2% | 93.3%  | 36.2%   |
| Speculative Grade                          | 178    | 56.1% | 66.0%  | 30.2%   | Speculative Grade                                      | 328    | 74.2% | 93.2%  | 32.9%   |
| All Rating                                 | 425    | 53.5% | 64.5%  | 30.6%   | All Rating   | 425    | 73.1% | 93.3%  | 33.7%   |

Figure 38 demonstrates that on average the present value of losses at origination for all resolved principal-impaired structured finance securities is 54% of the original balance. This is about eight percentage points lower than the average 62% LGD rate in the corporate sector.<sup>27</sup> Additionally, although the average LGD rate in the investment-grade category is slightly lower than that in the speculative-grade category, the average LGD rates are not materially differentiated by broad rating at origination or at impairment. Figure 38 also suggests that the LGD rates have a skewed distribution since the median is greater than the mean across all rating categories.

26. See Moody's Special Comment, "Measuring Loss-Given-Default for Structured Finance Securities: An Update," December 2006.

27. See Moody's Special Comment, "Corporate Default and Recovery Rates, 1920-2006," February 2007.

Although the LGD rates of resolved impairments are not significantly different across rating categories, Figure 39 illustrates that the differences across sectors can be fairly large.

Figure 39  
**Realized Final LGD Rates by Sector for All Resolved Principal Impairments, 1993-2006**

| Impaired Asset Classes        | Investment-Grade at Origination |              | Speculative-Grade at Origination |              |
|-------------------------------|---------------------------------|--------------|----------------------------------|--------------|
|                               | Counts                          | Mean         | Counts                           | Mean         |
| <b>US ABS ex. HEL</b>         | <b>120</b>                      | <b>71.0%</b> | <b>50</b>                        | <b>74.6%</b> |
| ABS - Automobiles - Subprime  | 0                               | NA           | 1                                | 1.9%         |
| ABS - Credit Card - Bank      | 2                               | 58.7%        | 2                                | 88.9%        |
| ABS - Franchise Loans         | 10                              | 80.1%        | 12                               | 83.6%        |
| ABS - Health Care Receivables | 22                              | 88.6%        | 0                                | NA           |
| ABS - Leases - Equipment      | 0                               | NA           | 1                                | 21.1%        |
| ABS - Leases - Aircraft       | 2                               | 37.2%        | 0                                | NA           |
| ABS - Manufactured Housing    | 84                              | 66.4%        | 34                               | 74.3%        |
| <b>US RMBS/HEL</b>            | <b>93</b>                       | <b>29.3%</b> | <b>90</b>                        | <b>44.7%</b> |
| <b>US CMBS</b>                | <b>5</b>                        | <b>32.2%</b> | <b>24</b>                        | <b>60.3%</b> |
| <b>Global CDOs</b>            | <b>28</b>                       | <b>47.5%</b> | <b>14</b>                        | <b>56.5%</b> |
| Balance Sheet Synthetic       | 5                               | 61.7%        | 8                                | 50.4%        |
| HY CBO                        | 9                               | 53.9%        | 4                                | 76.8%        |
| HY CLO                        | 2                               | 7.8%         | 0                                | NA           |
| SF CDO                        | 1                               | 30.4%        | 1                                | 58.3%        |
| Synthetic Arbitrage           | 11                              | 44.5%        | 1                                | 21.9%        |

The descriptive statistics in Figure 39 have at least three notable implications.

First, for impaired tranches that were rated investment grade at origination, the average LGD rate was much lower in the RMBS, HEL, CMBS (MBS) sectors than in the US ABS sector,<sup>28</sup> and the average LGD rate of resolved CDO impairments was in between those of ABS and MBS.<sup>29</sup>

Second, for impaired tranches that were rated speculative grade at origination, the average LGD rate was much lower in the RMBS and HEL sectors than in the CMBS and CDO sectors. Additionally, the resolved speculative-grade US ABS impairments have experienced the highest LGD of about 75%.

Third, the average LGD rates were lower in the investment-grade category than in the speculative-grade category for three major sectors: US RMBS/HEL, US CMBS, and global CDOs, but generally not for US ABS excluding HEL. However, it was true for the sector's manufactured housing category, which accounted for an overwhelming majority of resolved principal-impaired ABS.

### **LGD for Impaired RMBS/HEL Tranches**

After incorporating the 2006 payment and loss data, the total number of principal-impaired RMBS and HEL tranches increased to 278.<sup>30</sup> Using the expanded data sample, we validated our previous LGD projection model.

Figure 40 summarizes our latest LGD estimates, which are slightly higher but roughly the same as those reported in our previous studies. Specifically, securities rated Aaa and Aa at origination continued to show very low LGD rates, and the speculative-grade rated securities lost about 15 percentage points more than the investment-grade rated securities did. In addition, the average LGD rate as a share of impairment-date balance is about 53%, almost 20 percentage points higher than the average LGD rate of roughly 33% as a share of original balance, largely as a result of principal amortization between origination date and impairment date and discounting.

28. The loss severity rate of the investment-grade US ABS ex. HEL sector was significantly impacted by the high LGD rates of 22 impaired ABS securities backed by healthcare receivables. Excluding this asset type results in a LGD of 67% in the investment-grade category for the US ABS (ex. HEL) sector.

29. Most of the investment-grade impairments were Baa-rated at origination. Therefore, the differences in the average LGD rates in the investment-grade category are mainly driven by those rated Baa.

30. In past studies, we included the loss data of RMBS/HEL tranches issued prior to 1993 to increase the size of our data set. However, the size of our RMBS/HEL LGD data sample has increased substantially over the past few years, and the benefit of including tranches issued before 1993 has greatly diminished. The characteristics of LGD rates on these older tranches appear to be similar to those issued during 1993-2006; therefore, we dropped them in this report.



Figure 40

### Estimated Final LGD Rates by Rating for a Combined Sample of Resolved and Unresolved RMBS/HEL Principal Impairments, 1993-2006

| By Original Rating (% of original balance) |        |       |        |         | By Rating at Impairment (% of impairment-date balance) |        |       |        |         |
|--|--------|-------|--------|---------|--|--------|-------|--------|---------|
|  | Counts | Mean  | Median | Std Dev |  | Counts | Mean  | Median | Std Dev |
| Aaa  | 8      | 2.8%  | 3.2%   | 1.0%    | Aaa  | 0      | NA    | NA     | NA      |
| Aa   | 9      | 13.2% | 14.9%  | 5.2%    | Aa   | 1      | 2.8%  | 2.8%   | NA      |
| A  | 19     | 25.1% | 22.5%  | 19.6%   | A  | 8      | 37.1% | 28.9%  | 28.8%   |
| Baa  | 131    | 30.1% | 25.1%  | 23.6%   | Baa  | 49     | 34.6% | 27.4%  | 30.7%   |
| Ba   | 59     | 33.4% | 28.4%  | 24.8%   | Ba   | 66     | 48.9% | 43.9%  | 31.1%   |
| B  | 52     | 53.0% | 63.1%  | 27.6%   | B  | 97     | 62.8% | 61.7%  | 31.9%   |
| Caa  | 0      | NA    | NA     | NA      | Caa  | 57     | 59.8% | 64.0%  | 31.1%   |
| Investment Grade                           | 167    | 27.3% | 22.5%  | 22.9%   | Investment Grade                                       | 58     | 34.4% | 26.2%  | 30.2%   |
| Speculative Grade                          | 111    | 42.6% | 41.8%  | 27.8%   | Speculative Grade                                      | 220    | 57.8% | 56.5%  | 31.9%   |
| All Ratings                                | 278    | 33.4% | 28.0%  | 26.0%   | All Ratings  | 278    | 52.9% | 50.2%  | 32.9%   |

Note: Impairments are identified as of December 31, 2006; however, LGD rate statistics are updated through January 2007.

### LGD for Impaired CDO Tranches

In our first study of CDO impairments and losses, we derived a simple model to project final LGD rates for impaired but unresolved high-yield CBO tranches, which had experienced the greatest number of impairments within the CDO sector. In this report, we continue to use this same model, but only apply it to all unresolved principal-impaired cash CDOs.<sup>31</sup> CDO tranches that experienced only interest shortfalls are not included in the LGD analysis as interest impairments have frequently been cured, and if not, they would ultimately become principal impairments.

Figure 41 summarizes the estimated final LGD rates of CDO principal impairments including both resolved and unresolved tranches, cash and synthetic securities, and U.S. both European transactions.

Figure 41

### Estimated Final LGD Rates by Rating for a Combined Sample of Resolved and Unresolved CDO Principal Impairments, 1993-2006

| By original rating (% of original balance) |        |       |        |         | By rating at impairment (% of impairment-date balance) |        |       |        |         |
|--|--------|-------|--------|---------|--|--------|-------|--------|---------|
|  | Counts | Mean  | Median | Std Dev |  | Counts | Mean  | Median | Std Dev |
| Aaa  | 0      | NA    | NA     | NA      | Aaa  | 0      | NA    | NA     | NA      |
| Aa   | 6      | 30.5% | 24.5%  | 28.6%   | Aa   | 0      | NA    | NA     | NA      |
| A  | 6      | 72.0% | 79.1%  | 30.4%   | A  | 4      | 95.0% | 95.9%  | 5.1%    |
| Baa  | 107    | 60.6% | 69.5%  | 25.7%   | Baa  | 42     | 85.1% | 97.1%  | 22.2%   |
| Ba   | 50     | 60.0% | 57.3%  | 22.8%   | Ba   | 36     | 84.7% | 95.2%  | 20.4%   |
| B  | 30     | 65.8% | 66.5%  | 25.5%   | B  | 59     | 81.1% | 95.2%  | 26.1%   |
| Caa  | 0      | NA    | NA     | NA      | Caa  | 58     | 77.6% | 100.0% | 31.9%   |
| Investment Grade                           | 119    | 59.7% | 67.7%  | 26.8%   | Investment Grade                                       | 46     | 86.0% | 97.1%  | 21.4%   |
| Speculative Grade                          | 80     | 62.2% | 65.3%  | 23.9%   | Speculative Grade                                      | 153    | 80.6% | 97.4%  | 27.3%   |
| All Ratings                                | 199    | 60.7% | 66.8%  | 25.6%   | All Ratings  | 199    | 81.9% | 97.4%  | 26.1%   |

Figure 41 reveals several interesting findings about LGDs of impaired CDO tranches:

- The average LGD rates of principal-impaired CDO tranches have generally not been correlated with their original rating levels, although that of Aa-rated tranches was significantly lower than in other rating categories. Consequently, the average LGD rate is marginally lower in the investment-grade category than in the speculative-grade category.

31. See "Default & Loss Rates of U.S. CDOs: 1993-2003," Moody's Special Comment, March 2005. The model uses the weighted average rating factor (WARF) and the weighted average maturity (WAM), as reported by Moody's deal performance reports, to find the weighted average loss rates expected in the pool. These expected pool loss rates are used to adjust the 2006 year-end OC ratios, after taking into account the potential excess interest that would become available in the deal, if any excess exists. The adjusted OC ratios are then used to derive future payments available to the impaired tranches and compute the tranches' projected loss rates.

- The average LGD rates by impairment date balance were generally much higher than those by original balance, thanks mostly to both discounting and principal amortization, and there was also little correlation between rating at impairment and loss severity.
- The median LGD rates were higher than the mean LGD rates for almost all original rating categories, and more so by rating at impairment.

### **LGD for Impaired MH Tranches**

In a December 2006 Special Comment, Moody's introduced a new LGD projection model for impaired ABS securities backed by manufactured housing loans.<sup>32</sup> The model predicts the cumulative loss of the underlying asset pool and then propagates the losses to the tranches of the deal. Figure 42 reports the estimated LGD rates for 226 impaired MH tranches based on data as of the end of 2006.

Figure 42  
**Estimated Final LGD Rates by Rating for a Combined Sample of Resolved and Unresolved MH Principal Impairments, 1993-2006**

| By original rating (% of original balance) |        |       |        |         | By rating at impairment (% of impairment-date balance) |        |       |        |         |
|--|--------|-------|--------|---------|--|--------|-------|--------|---------|
|  | Counts | Mean  | Median | Std Dev |  | Counts | Mean  | Median | Std Dev |
| Aaa  | 0      | NA    | NA     | NA      | Aaa  | 0      | NA    | NA     | NA      |
| Aa   | 26     | 52.5% | 52.7%  | 13.2%   | Aa   | 3      | 83.3% | 86.2%  | 8.8%    |
| A  | 32     | 65.8% | 66.7%  | 7.6%    | A  | 12     | 72.2% | 80.2%  | 20.9%   |
| Baa  | 123    | 53.4% | 54.8%  | 21.2%   | Baa  | 45     | 82.2% | 94.6%  | 27.4%   |
| Ba   | 43     | 71.5% | 78.2%  | 18.8%   | Ba   | 70     | 85.9% | 94.5%  | 20.6%   |
| B  | 2      | 79.9% | 79.9%  | 0.4%    | B  | 54     | 79.5% | 88.3%  | 22.3%   |
| Caa  | 0      | NA    | NA     | NA      | Caa  | 42     | 87.3% | 87.1%  | 11.1%   |
| Investment Grade                           | 181    | 55.5% | 58.1%  | 19.0%   | Investment Grade                                       | 60     | 80.2% | 92.4%  | 25.7%   |
| Speculative Grade                          | 45     | 71.9% | 78.6%  | 18.5%   | Speculative Grade                                      | 166    | 84.2% | 91.7%  | 19.5%   |
| All Ratings                                | 226    | 58.7% | 62.4%  | 20.0%   | All Ratings  | 226    | 83.1% | 91.8%  | 21.3%   |

Figure 42 reveals that the average LGD rate of impaired MH tranches was approximately 59% as a share of original balance and 83% as a share of impairment-date balance. These severity rates are similar to those of impaired CDO tranches and much higher than those of impaired RMBS and HEL tranches.

In addition, at least by original rating, there is some correlation between rating and the average LGD rate, as the average LGD rates of Ba and B-rated tranches are markedly higher than those rated Baa or above.

### **LGD by Time Horizon**

One of the essential inputs of the multi-year cumulative loss rate calculations are the multi-year average LGD rates. Introducing time horizon into the LGD rate concept is necessitated by the possible change of ratings, the change of cohort-date principal balance, and discounting. The estimated average multi-year LGD rates therefore depend on how impairments are distributed over the measured time horizon, in contrast with the LGD rates we analyzed above, which were averages of LGD rates of the impaired tranches regardless of when the tranches were impaired.

Figures 43 and 44 separately present two types of horizon-based LGD rates. Figure 43 reports the average LGD rate by original rating for securities impaired in the *n*th year after issuance, where *n* goes from 1 to 7. Note that there is no averaging across time horizons in Figure 43, and the LGD rates are averaged exclusively within each horizon and rating bucket. For example, the average Baa fifth-year LGD rate of 38.2% is based on a total of 67 Baa securities that were impaired during the fifth year after issuance. Figure 43 also reveals that the average LGD rates fall sharply over time, exhibiting significant discounting and amortization effects.

32. See Moody's Special Comment, "Measuring Loss-Given-Default for Structured Finance Securities: An Update," December 2006.

Figure 43

**Estimated Average LGD Rates (% of Original Balance) for All Structured Finance Securities that Were Impaired during the Nth (N=1, 2, ...,7) Year after Origination Date, 1993-2006**

| Original Rating   | Number of Years after Origination |       |       |       |       |       |       |
|-------------------|-----------------------------------|-------|-------|-------|-------|-------|-------|
|                   | 1                                 | 2     | 3     | 4     | 5     | 6     | 7     |
| Aaa               | 75.0%                             | 75.0% | 75.0% | 39.3% | 14.9% | 1.0%  | NA    |
| Aa                | 100.0%                            | 92.5% | 77.8% | 41.7% | 53.3% | 50.9% | 30.6% |
| A                 | NA                                | 43.3% | 60.9% | 61.5% | 52.5% | 46.1% | 19.5% |
| Baa               | 81.3%                             | 58.9% | 66.7% | 49.8% | 38.2% | 35.0% | 39.3% |
| Ba                | 93.1%                             | 70.0% | 60.4% | 44.9% | 43.4% | 27.5% | 18.3% |
| B                 | 90.1%                             | 67.8% | 72.7% | 54.2% | 45.4% | 20.7% | 63.9% |
| Caa               | NA                                | NA    | 84.8% | NA    | 80.6% | NA    | NA    |
| Investment Grade  | 82.5%                             | 61.7% | 66.7% | 49.8% | 40.5% | 36.3% | 36.7% |
| Speculative Grade | 91.6%                             | 69.4% | 66.4% | 48.4% | 46.0% | 23.7% | 25.9% |
| All Ratings       | 85.1%                             | 65.7% | 66.5% | 49.4% | 42.2% | 33.4% | 34.7% |

Note: The average LGD rate in the nth year is calculated using securities impaired during the nth year after issuance date, where n goes from 1 to 7. Other than the Baa category, the number of observations in each rating category is less than five in the 7th year. For instance, there is just one security (a CMBS tranche) for the single-B rating category in the 7th year, which had a high LGD of 63.9%. As a result, the average LGD rates at longer time horizons, especially at 6th and 7th years, are subject to small sample biases.

The average LGD rates in Figure 44 differ from those in Figure 43 in several different ways. First, for Figure 44, we used cohort ratings, or ratings outstanding at any given point of time such as the beginning of a calendar year or a month. The more important difference between Figure 44 and Figure 43 lies in the way these average LGD rates are calculated.

For example, the four-year Baa LGD rate of 51.6% in Figure 44 represents the average of the LGD rates on tranches that were impaired in each of the four years after a cohort date and the average is weighted by the incremental impairment rate of each year.<sup>33</sup> This average LGD rate therefore represents the average LGD rate on all securities impaired at any time between the cohort formation date and the end of the fourth year after the cohort date. In other words, these average LGD rates are averaged over time, whereas those in Figure 43 are not.

Figure 44

**Estimated Average Multi-Year LGD Rates (% of Cohort-Date Balance) of All Structured Finance Securities by Cohort Rating, 1993-2006**

| Cohort Rating     | Number of Years after Cohort Formation Date |       |       |       |       |       |       |
|-------------------|---|-------|-------|-------|-------|-------|-------|
|                   | 1   | 2     | 3     | 4     | 5     | 6     | 7     |
| Aaa               | 75.0%                                       | 42.9% | 22.8% | 14.8% | 12.4% | 11.8% | 11.8% |
| Aa                | 85.5%                                       | 70.2% | 62.3% | 57.4% | 54.4% | 51.5% | 48.9% |
| A                 | 60.2%                                       | 63.9% | 61.4% | 58.7% | 56.4% | 52.3% | 48.5% |
| Baa               | 64.8%                                       | 61.2% | 56.5% | 51.6% | 47.6% | 44.2% | 40.8% |
| Ba                | 69.7%                                       | 63.3% | 58.3% | 54.7% | 51.5% | 48.7% | 45.9% |
| B                 | 68.9%                                       | 67.4% | 64.7% | 59.7% | 54.7% | 52.4% | 51.2% |
| Caa               | 66.4%                                       | 63.2% | 61.5% | 59.3% | 55.7% | 54.1% | 54.1% |
| Investment Grade  | 65.6%                                       | 61.8% | 56.9% | 52.0% | 48.3% | 45.0% | 41.7% |
| Speculative Grade | 68.9%                                       | 65.0% | 61.3% | 57.2% | 53.3% | 50.6% | 48.2% |
| All Ratings       | 68.0%                                       | 64.0% | 59.7% | 55.6% | 51.9% | 49.3% | 47.2% |

Note: Cohort ratings are ratings on securities outstanding at the beginning of a cohort horizon, regardless of when they were issued. Cohort LGD rates are not calculated for impaired securities without historical principal balance information.

33. See Appendix 2 for an example.

## Historical Average Multi-Year Loss Rates

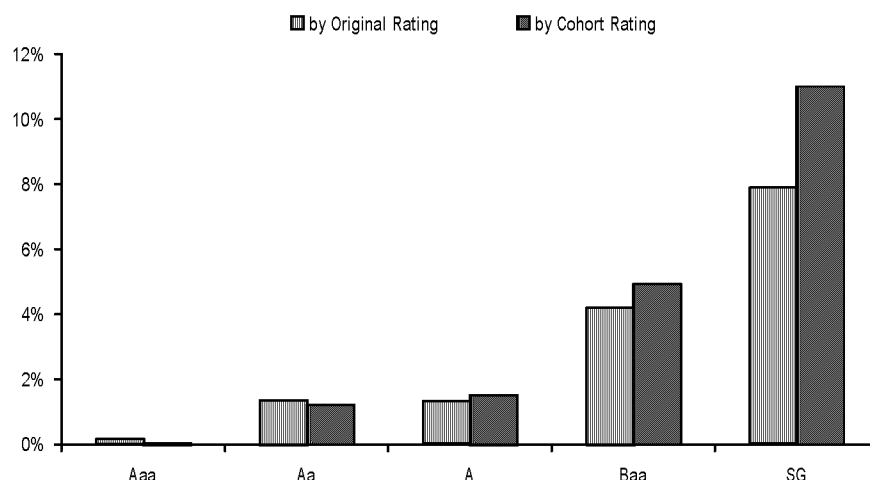
Multi-year cumulative loss rates are the product of multi-year cumulative impairment rates and multi-year cumulative LGD rates. At present, we have projected final LGD rates and realized final LGD rates for a large number of impaired securities across a variety of asset classes. As a result, in this report we use the sector specific average LGD rates for the sector specific average loss rate calculation. For example, to calculate average multi-year loss rates for the US ABS sector, the multi-year LGD rates are based on all impaired ABS securities in our data sample. To calculate average multi-year loss rates for the all structured finance category, we use the multi-year LGD rates based on all impaired structured finance securities, instead of using weighted average LGD rates from RMBS/HEL and CDOs, as we did in prior reports.

There is however one exception. The US CMBS sector still has only a small number of principal-impaired tranches, especially for the four-year or longer time horizons. Because the CMBS LGD rates by rating and horizon appeared similar to those in RMBS and HEL, we use a combined sample of impaired RMBS, HEL and CMBS securities to derive its average multi-year LGD rates by rating.

Figure 45 provides the resulting estimated five-year cumulative loss rates by both original and cohort rating. Detailed multi-year cumulative loss rates by rating, horizon, and sector appear in Appendix 5.

Figure 45

### Structured Finance Five-Year Cumulative Loss Rates by Rating, 1993-2006



These updated historical average loss rates by rating are largely similar to what we provided in previous reports.<sup>34</sup> In particular:

- The estimated five-year loss rates continued to increase as ratings decrease, and the relationship between loss rates and ratings was similar between those measured by cohort rating and those measured by original rating.
- Average loss rates continued to be higher when measured by cohort rating than by original rating in the single-A, Baa, and speculative-grade (SG) categories. One of the main reasons is the momentum effect, which says that a downgraded security has a higher probability of being downgraded again and/or default than a security that has the same rating but has never been downgraded. Similarly, an upgraded security has a lower probability of being downgraded and/or default than a security that has the same rating but has never been upgraded.
- Compared to those in last year's report, the estimated five-year loss rates are higher in the Aaa and Aa categories, which is mainly the result of the increases in the estimated LGD rates for impaired Aaa-rated and Aa-rated ABS securities. In the single-A or below categories, the average five-year loss rates were all lower compared to the prior year's results as the credit performance of the securities in these categories improved in 2006.

34. The historical average multi-year loss rate is the product of the average multi-year cumulative principal impairment rate and average multi-year LGD rate. The multi-year cumulative principal impairment rate is calculated by first deriving a marginal principal impairment rate and a marginal survival rate for survived securities, i.e. securities that were not impaired and not withdrawn in prior periods, then cumulating the marginal survival rates into a cumulative survival rate, which is converted into a cumulative impairment rate as one minus the cumulative survival rate. In particular, our methodology adjusts for withdrawn (WR) securities by removing previously withdrawn securities from the denominator of a subsequent period's marginal impairment rate. Please see Appendix 2 for more explanations.

## Appendix 1: Descriptions of Data Sample and Glossary

---

### DESCRIPTION OF DATA SAMPLE

The data sample for the study covers all structured finance rating observations globally between 1993 and 2006 and uses the following set of criteria:

- Only securities carrying long-term bond ratings are included, whereas short-term ratings, foreign national ratings, provisional ratings, and rating estimates are excluded.
- Tranches wrapped by financial guarantors, government agencies, or government sponsored enterprises (GSEs) are excluded.
- Interest-only (IO) tranches and residual tranches are excluded.
- Deals whose credit quality are entirely dependent on a single corporate rating, such as single borrower credit tenant lease (CTL) deals in CMBS, are excluded. Structured finance ratings in the "Other" category, such as structured notes and repackaged securities, are generally linked to the credit rating of a single reference entity and excluded from this study.
- Tranches carrying the same rating from the same deal, regardless of their rating levels, are collapsed into a single rating observation, with the following exception: if two or more tranches share the same rating in the same deal, but are collateralized by distinct groups of loan pools, then the tranches are not collapsed. Additionally, we do not review each tranche of every deal in order to determine whether it is *pari passu* to another tranche of the same deal.

During each year's update, Moody's not only adds new rating and default/loss data to the data sample, but also updates past data observations using the latest information from servicers and trustees, who periodically produce new reports as well as updates on their past reports. The number of outstanding securities, impairments, and the amount of losses may change depending on the securities' latest payment reports. In addition, small data errors may also have been discovered and corrected. As a result, past impairment and loss rates are subject to minor revisions. This report has incorporated all these necessary changes. Finally, the structured finance data set used in this study is available through Moody's Structured Finance Default Risk Service (DRS) database.

### GLOSSARY

#### ***Payment Shortfall***

Structured finance securities are defined as being in payment shortfall (previously called "payment default") if they have suffered:

- an interest shortfall, or
- a principal write-down.

#### ***Material Impairment***

Structured finance securities are defined as being in material impairment if they have:

- sustained a payment shortfall that remained uncured, or
- been downgraded to Ca or C.

Prepayment-related and AFC-related interest shortfalls are not considered to be material impairments, but PIK-ing tranches are. Explicit principal write-downs are included whereas implicit principal write-downs or under-collateralizations are not.

The impairment status of a security may change as it goes from cured (i.e. all outstanding shortfalls and losses were repaid in full) to uncured (i.e. positive interest shortfalls or principal losses outstanding), or vice versa. If any securities rated Ca or C but not in payment shortfall are upgraded, they are considered to be no longer in material impairment. Securities rated Ca or C that were not upgraded are in material impairment even if their payment shortfalls have been cured. Finally, securities with very minor shortfalls or losses are excluded.

#### ***Principal Impairment***

This refers to materially impaired securities that have suffered principal write-downs or principal losses, or have been downgraded to Ca or C even though a principal write-down or loss has not yet been observed. In particular, if a secu-

rity had experienced principal write-down/ loss or was downgraded to Ca or C, it is called principal impairment regardless of whether it had experienced interest shortfalls.

### ***Interest Impairment***

This refers to materially impaired securities that have experienced only interest shortfalls, no principal losses, and were not downgraded to Ca or C.

### ***Investment Grade (IG) Securities***

This refers to securities rated Aaa, Aa1, Aa2, Aa3, A1, A2, A3, Baa1, Baa2, and Baa3.

### ***Speculative Grade (SG) Securities***

This refers to securities rated Ba1, Ba2, Ba3, B1, B2, B3, Caa1, Caa2, Caa3, Ca, and C.

### ***One-Year Impairment Rate***

This is the number of securities that became newly impaired in a given year divided by the number of securities outstanding at the beginning of a year.

### ***Trailing 12-Month Impairment Rate***

This is the number of securities that became impaired within a 12-month period after a cohort formation date divided by the number of securities outstanding at the cohort formation date. Cohorts are formed at the beginning of each month.

### ***Lifetime Impairment Rate***

This is the total number of impaired securities divided by the total number of securities issued over a particular time period without regard to the time horizon of impairments.

### ***Marginal Impairment Rate***

For a cohort of securities outstanding (or issued if by original rating) at the beginning of year  $t$ , the  $N$ -th year marginal impairment rate is the number of securities newly impaired in year  $(t+N)$  divided by the total number of securities that survived to that year. Securities that are impaired or withdrawn before the year have not survived, and therefore do not appear in the denominator of this rate.

### ***Multi-year Cumulative Impairment Rate***

This is one minus the multi-year cumulative survival rate, which is the product of the marginal survival rates in each year within the multi-year horizon. The marginal survival rate is one minus the marginal impairment rate.

### ***Loss Severity or LGD***

The LGD rate of an impaired structured finance security is measured by the sum of the present values of net losses, including both interest shortfalls and principal losses, discounted by the security's coupon rate and expressed as a percentage of a given principal balance such as the principal balance at origination, at the impairment date, or at any given cohort date.

### ***Resolved and Unresolved Impairments***

A materially impaired security is "resolved" in the sense that its principal balance has been reduced to zero, or "unresolved" in the sense that it has a positive principal balance outstanding as of the end of the study period. These were called matured and non-matured defaults in prior studies.

### ***Multi-Year Cumulative Loss Rate***

This is the product of the multi-year cumulative impairment rate and multi-year average LGD rate. The multi-year average LGD rate is estimated using the realized and estimated final LGD rates of impaired securities that have known loss severity rates, after taking into account the uncertainty of impairment timing.

## **ABS**

ABS stand for asset-backed securities. This structured finance sector includes securities backed by home equity loans (HEL) and both traditional asset types such as auto loans, credit card receivables, student loans, and manufactured housing loans, and non-traditional asset types such as mutual fund fees, tax liens, tobacco settlement payments, and intellectual property.

## **HEL**

The home equity loan or HEL sector includes securities backed by subprime (B&C) mortgage loans, home improvement loans, high loan-to-value (high LTV) loans, home equity lines of credit (HELOCs), and closed-end second-lien loans, as well as net interest margin (NIM) securitizations. It does not include securities backed by Alt-A mortgages, which are included in the RMBS sector. HEL is part of the ABS sector.

Prior to 1998, RMBS collateral was generally defined as first-lien residential mortgages, regardless of the credit quality of the borrower. HEL collateral generally included junior liens such as HELOCs or closed-end seconds. However, as subprime lending became more prevalent, the market shifted its definition such that HEL encompassed subprime first-lien residential mortgages while RMBS included first-lien mortgages made to higher quality borrowers. Since 1998 and especially in the last five years, a deal classified as RMBS by Moody's is generally backed by prime or Alt-A quality first-lien residential mortgages, while a deal classified as HEL can be backed by subprime first-lien mortgages or junior liens. Therefore, a subprime deal which would be classified as HEL today may have been classified as RMBS in the past.

## **Global CDOs**

CDOs stand for collateralized debt obligations. Derivative securities such as structured notes and repackaged securities are not considered to be part of this sector. Commercial real estate (CRE) CDOs, where 70% or more of the collateral is composed of CRE loans, are classified as CMBS. If the collateral backing the transaction contains less than 70% CRE loans, then the deal is classified as a CDO.

## **CMBS**

CMBS stand for commercial mortgage-backed securities. Commercial real estate (CRE) CDOs, where 70% or more of the collateral is composed of CRE loans, are classified as CMBS. If the collateral backing the transaction contains less than 70% CRE loans, then the deal is classified as a CDO.

## **RMBS**

RMBS stand for residential mortgage-backed securities. The large majority of these securities are backed by first-lien prime mortgages, but some are backed by Alt-A mortgages. For further details, see the definition of HEL.

## **All Structured Finance**

All structured finance captures global structured securities in four major sectors: ABS, CDO, CMBS, and RMBS.

## **U.S. Structured Finance**

U.S. structured finance securities are denominated in U.S. dollars and issued in the U.S. market or denominated in Canadian dollars and issued in Canada. In cases where the source of the underlying collateral and the denomination of the securities crossed multiple countries/regions, deals are classified by the location at which they are monitored.

## **Europe Structured Finance ex. CDOs**

This refers to all structured finance securities excluding CDOs issued in Europe, the Middle East, and Africa (EMEA). They are denominated in a currency from or issued out of a country in the EMEA region. In cases where the source of the underlying collateral and the denomination of the securities crossed multiple countries/regions, deals are classified by the location at which they are monitored. All CDOs are grouped in one category and not differentiated by their regions.

## **Other Structured Finance ex. CDOs**

This refers to all non-CDO structured finance securities issued from other regions such as Latin America, Japan, Australia, and other Asia-Pacific countries.

## Appendix 2: How to Calculate Multi-Year Material Impairment Rate and LGD Rate

### CUMULATIVE IMPAIRMENT RATE BY COHORT RATING

Moody's uses the same method to calculate multi-year cumulative impairment rates as that used in Moody's corporate issuer default studies. In particular, we make an adjustment to the denominator of a marginal impairment rate in a given period (such as a year) to reflect tranches whose ratings were withdrawn or impaired prior to that period. Such an adjustment ensures that future impairments can only occur to survived tranches, i.e. withdrawn tranches or impaired tranches are not eligible for impairments in the subsequent periods. In addition, we now use rating cohorts formed each month to construct cumulative impairment rates.

The cumulative impairment rate for a time horizon  $T$  is therefore calculated as:

$$D(T) = 1 - \prod_{t=1}^T (1 - d_t)$$

Where  $d_t$  ( $t$  is subscript) is the marginal impairment rate:

$$d_t = \frac{x_t}{n_t - w_t / 2}$$

Where  $x_t$  is the number of impairments in year  $t$ ,  $w_t$  is the number of rating withdrawals in year  $t$ , and  $t$

$$n_t = n_{t-1} - x_{t-1} - w_t$$

which is the number of tranches that survived into the cohort at time  $t$ . When the time horizon  $T$  is equal to 1, the cumulative impairment rate and the marginal impairment rate are equal. Note that in addition to removing the prior-year withdrawals from the denominator, half of the withdrawals in time  $t$  are also removed. This is because we use discrete data to estimate marginal impairment rate and the timing of withdrawals within a given period is assumed to be uniformly distributed.

Let us now look at an example, assuming all securities are carrying the same rating in both 2004 and 2005.

| An Example for Calculating a Two-Year Cumulative Impairment Rate |  |                    |                          |                                  |                    |
|--|--|--------------------|--------------------------|----------------------------------|--------------------|
| 2004   |  |                    | 2005                     |                                  |                    |
| At the beginning of 2004   |  | At the end of 2004 | At the beginning of 2005 |                                  | At the end of 2005 |
| Number of Securities Issued                                      |  | Impaired           | Withdrawn                | Number of Securities Outstanding |                    |
|  |  |                    |                          | Impaired                         | Withdrawn          |
| 200  |  | 10                 | 95                       | 95                               |                    |
|  |  |                    |                          | 5                                | 90                 |

In the example, the average first-year marginal impairment rate is  $(10+5)/(200+95-95/2-90/2)$ , or 7.41%. The second-year marginal impairment rate is  $5/(95-90/2)=10\%$ .<sup>35</sup> The average marginal survival rates are 92.6% and 90.0% in the first and second year, respectively. The average two-year cumulative survival rate is  $92.6\%*90.0\%=83.3\%$ . Therefore, the average two-year cumulative impairment rate is 16.7%.

We believe our method of calculating cumulative impairment rates provides the most relevant information to investors who want to look at the historical impairment experience when evaluating the risk of an investment with any particular expected maturity. There are, however, at least two other approaches found in the literature, which tend to produce lower impairment rates and/or fail to use all available information.

One approach, which is similar to the above method, calculates marginal impairment rates first, but it does not adjust for withdrawals, hence,  $n_t = n_{t-1} - x_{t-1}$ . As a result, the second year marginal impairment rate is  $5/(95+95-90/2)=3.45\%$ . The two-year cumulative impairment rate becomes  $(1-7.41\%)*(1-3.45\%) = 10.6\%$ .

Another approach calculates cumulative impairment rates using a ratings transition matrix, treating impairment as a "rating" category (we note that Moody's does not have a "D" or default rating category). For a given time horizon, ratings transition frequencies are calculated using only ratings observations at the beginning and the end of the time horizon. Newly issued ratings that have not spanned the entire time horizon are not included. For example, if additional securities are issued at the beginning of 2005, the impairment experience of those securities would not be included in a two-year impairment rate calculation. Therefore this latter approach does not fully utilize all available data.

35. There are two first-year cohorts in this example - one formed at the beginning of 2004 and the other formed at the beginning of 2005. However, there is only one second-year cohort - the observations in 2005 of the two-year cohort that is formed at the beginning of 2004.



## CUMULATIVE IMPAIRMENT RATE BY ORIGINAL RATING

As in previous structured finance default studies, we calculate impairment rates for both cohort and original ratings using essentially the same method. We find that cumulative impairment rates by original rating have on average been lower than those by cohort rating for structured finance as a whole. We also caution that the contrast of the impairment rates by these two types of ratings can be different depending on sector and sample period. This can be best illustrated in the following example.

| <b>An Example Showing the Difference between Cohort-Based Impairment Rates and Origination-Based Impairment Rates</b> |                    |           |  |                    |           |
|---|--------------------|-----------|--|--------------------|-----------|
| 2004  |                    |           | 2005   |                    |           |
| At the beginning of 2004  | At the end of 2004 |           | At the beginning of 2005                           | At the end of 2005 |           |
| Number of Securities Issued and Their Rating  | Impaired           | Withdrawn | Distribution of Outstanding Securities by Rating   | Impaired           | Withdrawn |
| 100, rated Baa  | 0                  | 0         | 95, remain Baa rated;<br>5, downgraded to single-B | 0                  | 95        |
| 100, rated single-B   | 0                  | 0         | 100, remain single-B                               | 5                  | 95        |

In the example, 100 Baa-rated and 100 single-B rated securities are issued at the beginning of 2004. 95 of the 100 Baa-rated securities have not changed their ratings and are withdrawn at the end of 2005, but five of them are downgraded to single-B in 2004 before they become impaired in 2005. Five of the 100 single-B rated securities issued in 2004 become impaired in 2005 and the rest (95 securities) are withdrawn in 2005.

Based on cohort ratings, the first-year marginal impairment rate in the Baa category is 0% since no impairments are observed on securities rated Baa in 2004 or 2005. The second year marginal impairment rate for Baa is  $5/(100-95/2)=9.5\%$  (this is based solely on the performance in 2005 of the 100 Baa-rated securities issued in 2004). Hence, the two-year cumulative impairment rate in the Baa rating category is 9.5%.

By original rating, the two-year cumulative impairment rate for the Baa rating category is also 9.5% because the Baa sample and performance are the same whether they are by original rating or cohort rating. In the single-B category, however, there are significant differences.

For the single-B rating category, the average first-year marginal impairment rate by cohort rating is  $(0+5+5)/(100+100+5-95/2)=6.35\%$ . Note that there are three first-year cohorts for single-B, and both the numerator and denominator include five single-B securities at the beginning of 2005 that are initially rated Baa at the beginning of 2004. The second-year marginal impairment rate by cohort rating is  $5/(100-95/2)=9.5\%$ . Therefore, the average two-year cumulative impairment rate is  $1-(1-6.35\%)*(1-9.5\%)=15.25\%$ .

However, by original rating, the first-year single-B marginal impairment rate is 0% because the only first-year in the example for single-B is 2004 and there are no impairments. The second-year marginal impairment rate is 9.5%, the same as that by cohort rating. This implies that the two-year cumulative impairment rate by original rating for single-B is 9.5%, which is substantially lower than the cumulative impairment rate of 15.25% by cohort rating.

The large difference illustrated above for single-B original-rating two-year impairment rates hinges on the treatment of the five securities initially rated Baa at the beginning of 2004 but rated single-B at the beginning of 2005. These securities are not originally rated single-B, but are downgraded to that rating. If the performance of these downgraded single-B's is worse than the original single-B's, then the cohort-rating based impairment rates will be higher than the original-rating based impairment rates. Conversely, if the performance of these downgraded single-B's is better, the cohort-rating based impairment rates will be lower instead.

## MULTI-YEAR CUMULATIVE LGD RATES

The concept of multi-year cumulative LGD rate is necessary when loss severity rates on all impaired securities are not available, so a direct calculation of the cumulative loss rate is not possible. The method can best be explained by an example. Suppose we know the average loss severity (as a percent of the cohort-date balance) of securities that were rated single-B two years before they defaulted and those rated single-B one year before they defaulted. We will call these loss severity values "marginal loss severity rates." To calculate the average loss severity rates of the single-B rated securities that defaulted within two years (either in year one or year two) one needs to take a weighted average of the one-year and the two-year marginal severity rates, where the weights are the shares of the two-year cumulative default rates attributable to year one and year two. The following is a concrete example.

| <b>An Example for Calculating a Two-Year Cumulative LGD Rate</b> |                    |           |                                  |                    |           |
|--|--------------------|-----------|----------------------------------|--------------------|-----------|
| 2004   |                    |           | 2005                             |                    |           |
| At the beginning of 2004   | At the end of 2004 |           | At the beginning of 2005         | At the end of 2005 |           |
| Number of Securities Issued                                      | Impaired           | Withdrawn | Number of Outstanding Securities | Impaired           | Withdrawn |
| 100  | 5 (LGD=30%)        | 0         | 95                               | 6 (LGD=50%)        | 89        |

In this example, there are five impairments in the first year, and all have a loss severity rate of 30% as a share of their balance at the beginning of 2004. Six securities are impaired in the second year, and all have a loss severity rate of 50%, which is expressed as a share of the principal balance at the beginning of 2004 - the two-year cohort-date balance. Note that in order to compute a two-year cumulative LGD rate, all marginal LGD rates need to be expressed as a share of the cohort-date balance with appropriate discounting.

In the example, the one-year impairment rate is 5%, and the two-year cumulative impairment rate is  $1 - (1 - 5\%)^2 = 9.75\%$ . The two-year cumulative LGD rate is:  $(5\% \cdot 30\% + 9.75\% \cdot 50\%) / 9.75\% = 43.9\%$ , which measures the average LGD rate over a two-year period, assuming no knowledge about the timing of impairments at the beginning of 2004.

The two-year cumulative loss rate is the product of the two-year cumulative impairment rate and the two-year cumulative LGD rate, i.e.  $9.75\% \cdot 43.9\% = 4.28\%$ .

Finally, our estimated average multi-year LGD rates can be directly computed from the tables in Appendices 4 and 5 by simply dividing the estimated multi-year loss rates by the multi-year impairment rates. Please note that the number of impaired securities at long horizons (such as six and seven years) for most asset classes is very small, and therefore the average LGD rates are not stable. In addition, LGD rates are not calculated for securities without historical principal balance information. We do calculate multi-year LGD rates by original rating for all impaired securities as the calculations only require original balances.

## Appendix 3: Material Impairment Rates by Rating<sup>36</sup>

Figure 46  
**Multi-Year Cumulative Impairment Rates by Cohort Rating, 1993-2006**

|                                       | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
|---------------------------------------|--------|--------|--------|--------|--------|--------|--------|
| <b>All Structured Finance</b>         |        |        |        |        |        |        |        |
| Aaa                                   | 0.03%  | 0.06%  | 0.15%  | 0.27%  | 0.35%  | 0.39%  | 0.40%  |
| Aa                                    | 0.16%  | 0.48%  | 1.06%  | 1.81%  | 2.48%  | 2.91%  | 3.25%  |
| A                                     | 0.23%  | 0.80%  | 1.51%  | 2.24%  | 2.94%  | 3.55%  | 3.88%  |
| Baa                                   | 1.00%  | 2.96%  | 5.62%  | 8.07%  | 10.99% | 13.83% | 16.66% |
| Ba                                    | 2.97%  | 7.04%  | 11.05% | 15.03% | 17.25% | 18.76% | 20.00% |
| B                                     | 5.39%  | 10.60% | 16.01% | 20.69% | 25.23% | 28.25% | 30.43% |
| Caa                                   | 23.11% | 34.64% | 43.60% | 55.89% | 63.90% | 68.72% | 69.60% |
| Investment Grade                      | 0.32%  | 0.98%  | 1.88%  | 2.79%  | 3.77%  | 4.66%  | 5.47%  |
| Speculative Grade                     | 4.86%  | 9.66%  | 14.31% | 18.76% | 21.93% | 24.07% | 25.64% |
| All Ratings                           | 0.87%  | 2.05%  | 3.43%  | 4.78%  | 6.04%  | 7.09%  | 7.98%  |
| <b>US ABS</b>                         |        |        |        |        |        |        |        |
| Aaa                                   | 0.07%  | 0.17%  | 0.38%  | 0.68%  | 0.87%  | 0.98%  | 0.99%  |
| Aa                                    | 0.41%  | 1.26%  | 2.71%  | 4.45%  | 5.96%  | 6.73%  | 7.17%  |
| A                                     | 0.33%  | 1.25%  | 2.47%  | 3.72%  | 4.99%  | 6.06%  | 6.69%  |
| Baa                                   | 1.45%  | 4.55%  | 9.30%  | 14.16% | 20.81% | 27.47% | 34.04% |
| Ba                                    | 8.36%  | 20.03% | 30.66% | 42.42% | 48.04% | 52.12% | 56.16% |
| B                                     | 19.62% | 33.92% | 45.64% | 52.00% | 58.06% | 61.08% | 63.54% |
| Caa                                   | 35.05% | 49.39% | 59.55% | 77.77% | 82.75% | 90.21% | 90.21% |
| Investment Grade                      | 0.52%  | 1.62%  | 3.24%  | 4.95%  | 7.00%  | 8.90%  | 10.66% |
| Speculative Grade                     | 13.11% | 25.59% | 36.35% | 46.94% | 52.55% | 56.34% | 59.76% |
| All Ratings                           | 1.34%  | 3.17%  | 5.37%  | 7.66%  | 9.94%  | 11.97% | 13.83% |
| <b>US ABS (excl. both MH and HEL)</b> |        |        |        |        |        |        |        |
| Aaa                                   | 0.12%  | 0.20%  | 0.29%  | 0.42%  | 0.59%  | 0.72%  | 0.75%  |
| Aa                                    | 1.05%  | 2.39%  | 3.95%  | 5.87%  | 8.17%  | 9.12%  | 9.12%  |
| A                                     | 0.17%  | 0.69%  | 1.47%  | 2.27%  | 3.15%  | 3.79%  | 4.02%  |
| Baa                                   | 1.08%  | 2.92%  | 5.44%  | 7.89%  | 10.94% | 15.54% | 19.83% |
| Ba                                    | 4.63%  | 13.25% | 19.61% | 25.86% | 32.88% | 40.81% | 47.56% |
| B                                     | 17.19% | 30.87% | 41.03% | 46.90% | 54.16% | 56.08% | 56.08% |
| Caa                                   | 32.75% | 48.34% | 65.01% | NA     | NA     | NA     | NA     |
| Investment Grade                      | 0.33%  | 0.87%  | 1.59%  | 2.34%  | 3.22%  | 4.00%  | 4.45%  |
| Speculative Grade                     | 11.48% | 22.04% | 29.99% | 37.93% | 44.51% | 50.45% | 54.25% |
| All Ratings                           | 0.90%  | 1.93%  | 2.96%  | 3.94%  | 4.96%  | 5.86%  | 6.38%  |
| <b>US CMBS</b>                        |        |        |        |        |        |        |        |
| Aaa                                   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| Aa                                    | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| A                                     | 0.03%  | 0.12%  | 0.23%  | 0.23%  | 0.23%  | 0.23%  | 0.23%  |
| Baa                                   | 0.23%  | 0.54%  | 0.71%  | 0.82%  | 0.93%  | 1.12%  | 1.44%  |
| Ba                                    | 0.30%  | 0.78%  | 1.55%  | 2.16%  | 2.71%  | 2.74%  | 2.74%  |
| B                                     | 1.81%  | 4.79%  | 9.35%  | 14.99% | 21.61% | 27.27% | 32.36% |
| Caa                                   | 16.24% | 30.03% | 41.80% | 53.47% | 64.20% | 70.97% | 73.25% |
| Investment Grade                      | 0.09%  | 0.22%  | 0.31%  | 0.34%  | 0.38%  | 0.45%  | 0.56%  |
| Speculative Grade                     | 1.77%  | 4.01%  | 7.05%  | 10.60% | 14.69% | 17.96% | 20.73% |
| All Ratings                           | 0.57%  | 1.33%  | 2.27%  | 3.31%  | 4.45%  | 5.35%  | 6.11%  |

36. We now construct 12-month rating cohorts each month to calculate average marginal and cumulative impairment rates. In the past, rating cohorts were formed annually. For more information on data sample and methodology, please see Appendices 1 and 2.

Figure 46

**Multi-Year Cumulative Impairment Rates by Cohort Rating, 1993-2006**

| <b>US HEL &amp; RMBS</b>                 |                   | 1-Year  | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
|--|-------------------|---------|--------|--------|--------|--------|--------|--------|
|  | Aaa               | 0.00%   | 0.05%  | 0.15%  | 0.30%  | 0.35%  | 0.38%  | 0.38%  |
|  | Aa                | 0.01%   | 0.05%  | 0.18%  | 0.32%  | 0.35%  | 0.35%  | 0.35%  |
|  | A                 | 0.12%   | 0.41%  | 0.72%  | 1.04%  | 1.31%  | 1.69%  | 2.11%  |
|  | Baa               | 0.64%   | 2.09%  | 4.27%  | 6.54%  | 8.36%  | 9.55%  | 10.53% |
|  | Ba                | 2.18%   | 5.11%  | 8.26%  | 10.78% | 12.60% | 13.78% | 14.71% |
|  | B                 | 5.05%   | 9.52%  | 13.75% | 16.40% | 18.59% | 19.87% | 20.83% |
|  | Caa               | 33.65%  | 42.91% | 47.41% | 52.91% | 57.31% | 61.55% | 61.55% |
|  | Investment Grade  | 0.18%   | 0.59%  | 1.20%  | 1.84%  | 2.31%  | 2.64%  | 2.93%  |
|  | Speculative Grade | 3.53%   | 7.07%  | 10.61% | 13.22% | 15.19% | 16.45% | 17.38% |
|  | All Ratings       | 0.50%   | 1.24%  | 2.18%  | 3.06%  | 3.73%  | 4.19%  | 4.55%  |
| <b>US HEL (post-1998 vintages only)</b>  |                   | 1-Year  | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
|  | Aaa               | 0.00%   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
|  | Aa                | 0.00%   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
|  | A                 | 0.00%   | 0.07%  | 0.35%  | 0.77%  | 1.37%  | 1.66%  | 1.66%  |
|  | Baa               | 0.33%   | 1.46%  | 3.92%  | 8.46%  | 13.48% | 16.24% | 16.24% |
|  | Ba                | 1.81%   | 5.74%  | 11.69% | 14.93% | 16.51% | 16.51% | 16.51% |
|  | B                 | 15.89%  | 25.06% | 35.71% | 45.96% | 51.32% | 52.27% | 52.27% |
|  | Caa               | 68.26%  | 97.11% | NA     | NA     | NA     | NA     | NA     |
|  | Investment Grade  | 0.11%   | 0.48%  | 1.29%  | 2.66%  | 4.25%  | 5.22%  | 5.22%  |
|  | Speculative Grade | 3.87%   | 8.79%  | 15.88% | 21.17% | 24.17% | 24.63% | 24.63% |
|  | All Ratings       | 0.29%   | 0.85%  | 1.96%  | 3.58%  | 5.28%  | 6.21%  | 6.21%  |
| <b>US RMBS (post-1998 vintages only)</b> |                   | 1-Year  | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
|  | Aaa               | 0.00%   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
|  | Aa                | 0.00%   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
|  | A                 | 0.17%   | 0.48%  | 0.64%  | 0.79%  | 0.79%  | 0.79%  | 0.79%  |
|  | Baa               | 0.10%   | 0.49%  | 1.37%  | 2.72%  | 2.72%  | 2.72%  | 2.72%  |
|  | Ba                | 0.47%   | 1.54%  | 3.54%  | 5.95%  | 5.95%  | 5.95%  | 5.95%  |
|  | B                 | 1.10%   | 2.06%  | 3.23%  | 3.63%  | 3.63%  | 3.63%  | 3.63%  |
|  | Caa               | 100.00% | NA     | NA     | NA     | NA     | NA     | NA     |
|  | Investment Grade  | 0.05%   | 0.17%  | 0.35%  | 0.62%  | 0.62%  | 0.62%  | 0.62%  |
|  | Speculative Grade | 0.76%   | 1.79%  | 3.45%  | 5.08%  | 5.08%  | 5.08%  | 5.08%  |
|  | All Ratings       | 0.13%   | 0.37%  | 0.76%  | 1.23%  | 1.23%  | 1.23%  | 1.23%  |
| <b>Global CDOs</b>                       |                   | 1-Year  | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
|  | Aaa               | 0.00%   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
|  | Aa                | 0.07%   | 0.25%  | 0.78%  | 1.92%  | 3.55%  | 5.86%  | 9.38%  |
|  | A                 | 0.37%   | 1.24%  | 2.20%  | 3.54%  | 4.62%  | 7.15%  | 9.01%  |
|  | Baa               | 2.07%   | 5.98%  | 10.75% | 14.41% | 17.48% | 19.60% | 22.01% |
|  | Ba                | 3.50%   | 8.56%  | 13.85% | 18.12% | 20.92% | 22.42% | 25.92% |
|  | B                 | 10.74%  | 21.55% | 32.13% | 41.07% | 48.09% | 51.47% | 51.47% |
|  | Caa               | 20.17%  | 28.65% | 34.87% | 48.51% | 64.89% | 64.89% | NA     |
|  | Investment Grade  | 0.65%   | 1.97%  | 3.69%  | 5.32%  | 6.88%  | 8.62%  | 11.01% |
|  | Speculative Grade | 6.60%   | 13.23% | 19.79% | 25.36% | 29.57% | 31.84% | 34.12% |
|  | All Ratings       | 1.62%   | 3.88%  | 6.46%  | 8.76%  | 10.75% | 12.55% | 14.89% |

Figure 46

**Multi-Year Cumulative Impairment Rates by Cohort Rating, 1993-2006**

| Global CDOs excl. HYCBOs                                |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year  | 6-Year | 7-Year |
|---|-------------------|--------|--------|--------|--------|---------|--------|--------|
|   | Aaa               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%   | 0.00%  | 0.00%  |
|   | Aa                | 0.08%  | 0.29%  | 0.71%  | 1.41%  | 2.01%   | 2.01%  | 2.01%  |
|   | A                 | 0.26%  | 0.83%  | 1.42%  | 2.28%  | 2.76%   | 3.35%  | 3.35%  |
|   | Baa               | 1.15%  | 3.52%  | 6.35%  | 8.62%  | 9.86%   | 10.75% | 12.85% |
|   | Ba                | 1.43%  | 3.52%  | 6.18%  | 9.36%  | 11.05%  | 13.23% | 18.80% |
|   | B                 | 6.41%  | 12.31% | 17.36% | 22.70% | 30.10%  | 32.66% | 32.66% |
|   | Caa               | 16.88% | 22.04% | 26.25% | 41.38% | 100.00% | NA     | NA     |
|   | Investment Grade  | 0.37%  | 1.17%  | 2.17%  | 3.17%  | 3.79%   | 4.22%  | 5.16%  |
|   | Speculative Grade | 3.48%  | 6.48%  | 9.66%  | 13.46% | 17.05%  | 19.38% | 23.11% |
|   | All Ratings       | 0.80%  | 1.94%  | 3.28%  | 4.71%  | 5.82%   | 6.55%  | 7.84%  |
| <b>European Structured Finance (excl. CDOs)</b>         |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year  | 6-Year | 7-Year |
|   | Aaa               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%   | 0.00%  | 0.00%  |
|   | Aa                | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%   | 0.00%  | 0.00%  |
|   | A                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%   | 0.00%  | 0.00%  |
|   | Baa               | 0.06%  | 0.16%  | 0.30%  | 0.56%  | 1.08%   | 2.28%  | 2.28%  |
|   | Ba                | 0.10%  | 0.57%  | 1.17%  | 1.26%  | 1.26%   | 1.26%  | 1.26%  |
|   | B                 | 1.83%  | 4.33%  | 4.33%  | 4.33%  | NA      | NA     | NA     |
|   | Caa               | 3.98%  | 5.56%  | 5.56%  | 5.56%  | 5.56%   | 5.56%  | 5.56%  |
|   | Investment Grade  | 0.01%  | 0.03%  | 0.05%  | 0.09%  | 0.16%   | 0.30%  | 0.30%  |
|   | Speculative Grade | 0.40%  | 1.02%  | 1.58%  | 1.66%  | 1.66%   | 1.66%  | 1.66%  |
|   | All Ratings       | 0.03%  | 0.08%  | 0.13%  | 0.17%  | 0.23%   | 0.36%  | 0.36%  |
| <b>Structured Finance in Other Regions (excl. CDOs)</b> |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year  | 6-Year | 7-Year |
|   | Aaa               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%   | 0.00%  | 0.00%  |
|   | Aa                | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%   | 0.00%  | 0.00%  |
|   | A                 | 0.24%  | 0.41%  | 0.41%  | 0.41%  | 0.41%   | 0.41%  | 0.41%  |
|   | Baa               | 0.02%  | 0.02%  | 0.02%  | 0.02%  | 0.02%   | 0.02%  | 0.02%  |
|   | Ba                | 0.35%  | 1.16%  | 2.58%  | 5.28%  | 11.37%  | 20.58% | 20.58% |
|   | B                 | 0.41%  | 0.41%  | 0.41%  | 0.41%  | 0.41%   | NA     | NA     |
|   | Caa               | 3.57%  | 3.57%  | 3.57%  | 3.57%  | NA      | NA     | NA     |
|   | Investment Grade  | 0.04%  | 0.07%  | 0.07%  | 0.07%  | 0.07%   | 0.07%  | 0.07%  |
|   | Speculative Grade | 0.66%  | 1.29%  | 2.48%  | 4.97%  | 11.02%  | 20.27% | 20.27% |
|   | All Ratings       | 0.08%  | 0.17%  | 0.23%  | 0.34%  | 0.56%   | 0.87%  | 0.87%  |

Figure 47

**Multi-Year Cumulative Impairment Rates by Original Rating, 1993-2006**

| <b>All Structured Finance</b>         |  | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
|---------------------------------------|--|--------|--------|--------|--------|--------|--------|--------|
| Aaa                                   |  | 0.06%  | 0.10%  | 0.12%  | 0.23%  | 0.49%  | 0.59%  | 0.66%  |
| Aa                                    |  | 0.10%  | 0.30%  | 0.52%  | 1.36%  | 2.60%  | 3.36%  | 3.94%  |
| A                                     |  | 0.03%  | 0.24%  | 0.84%  | 1.68%  | 2.68%  | 3.67%  | 4.06%  |
| Baa                                   |  | 0.05%  | 0.70%  | 2.89%  | 6.01%  | 8.79%  | 11.95% | 14.07% |
| Ba                                    |  | 0.20%  | 2.24%  | 5.75%  | 9.87%  | 13.09% | 15.12% | 16.81% |
| B                                     |  | 0.21%  | 1.92%  | 7.84%  | 13.61% | 19.11% | 24.28% | 27.52% |
| Caa                                   |  | 1.79%  | 1.79%  | 5.12%  | 12.56% | 26.36% | 52.66% | 58.58% |
| Investment Grade                      |  | 0.06%  | 0.32%  | 1.03%  | 2.16%  | 3.37%  | 4.53%  | 5.28%  |
| Speculative Grade                     |  | 0.22%  | 2.14%  | 6.43%  | 11.12% | 15.26% | 18.88% | 21.26% |
| All Ratings                           |  | 0.08%  | 0.51%  | 1.63%  | 3.19%  | 4.78%  | 6.26%  | 7.22%  |
| <b>US ABS</b>                         |  | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
| Aaa                                   |  | 0.18%  | 0.26%  | 0.34%  | 0.59%  | 1.17%  | 1.39%  | 1.55%  |
| Aa                                    |  | 0.27%  | 0.86%  | 1.53%  | 3.64%  | 6.60%  | 8.80%  | 9.67%  |
| A                                     |  | 0.02%  | 0.23%  | 1.10%  | 2.55%  | 4.19%  | 5.89%  | 6.69%  |
| Baa                                   |  | 0.04%  | 0.73%  | 3.36%  | 8.11%  | 13.73% | 20.45% | 25.56% |
| Ba                                    |  | 0.42%  | 6.25%  | 16.10% | 24.80% | 34.74% | 38.32% | 45.33% |
| B                                     |  | 1.09%  | 9.69%  | 36.65% | 50.39% | 53.99% | 62.36% | 64.95% |
| Caa                                   |  | NA     | NA     | NA     | NA     | NA     | NA     | NA     |
| Investment Grade                      |  | 0.12%  | 0.47%  | 1.45%  | 3.28%  | 5.54%  | 7.84%  | 9.39%  |
| Speculative Grade                     |  | 0.57%  | 6.79%  | 20.08% | 29.91% | 38.40% | 43.59% | 49.38% |
| All Ratings                           |  | 0.14%  | 0.76%  | 2.26%  | 4.49%  | 7.06%  | 9.53%  | 11.31% |
| <b>US ABS (excl. both MH and HEL)</b> |  | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
| Aaa                                   |  | 0.37%  | 0.53%  | 0.65%  | 0.80%  | 0.92%  | 1.09%  | 1.37%  |
| Aa                                    |  | 1.84%  | 3.59%  | 4.84%  | 6.13%  | 8.69%  | 14.15% | 14.15% |
| A                                     |  | 0.06%  | 0.31%  | 1.09%  | 2.00%  | 3.27%  | 4.02%  | 4.60%  |
| Baa                                   |  | 0.15%  | 1.02%  | 4.31%  | 6.41%  | 7.87%  | 11.93% | 14.64% |
| Ba                                    |  | 0.53%  | 6.16%  | 12.60% | 18.88% | 24.82% | 27.50% | 40.11% |
| B                                     |  | 0.00%  | 8.00%  | 38.67% | 45.88% | 57.91% | 57.91% | 57.91% |
| Caa                                   |  | NA     | NA     | NA     | NA     | NA     | NA     | NA     |
| Investment Grade                      |  | 0.38%  | 0.80%  | 1.63%  | 2.38%  | 3.26%  | 4.46%  | 5.05%  |
| Speculative Grade                     |  | 0.91%  | 6.80%  | 16.47% | 22.83% | 29.61% | 31.88% | 41.28% |
| All Ratings                           |  | 0.40%  | 1.04%  | 2.19%  | 3.14%  | 4.19%  | 5.42%  | 6.22%  |
| <b>US CMBS</b>                        |  | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
| Aaa                                   |  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| Aa                                    |  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| A                                     |  | 0.00%  | 0.00%  | 0.35%  | 0.35%  | 0.35%  | 0.35%  | 0.35%  |
| Baa                                   |  | 0.07%  | 0.50%  | 1.09%  | 1.26%  | 1.26%  | 1.26%  | 1.26%  |
| Ba                                    |  | 0.12%  | 0.27%  | 0.87%  | 2.18%  | 2.58%  | 3.22%  | 3.22%  |
| B                                     |  | 0.28%  | 0.63%  | 2.23%  | 6.04%  | 13.54% | 18.05% | 23.64% |
| Caa                                   |  | 0.00%  | 0.00%  | 3.85%  | 12.39% | 27.85% | 57.91% | 64.93% |
| Investment Grade                      |  | 0.03%  | 0.19%  | 0.50%  | 0.56%  | 0.56%  | 0.56%  | 0.56%  |
| Speculative Grade                     |  | 0.19%  | 0.43%  | 1.57%  | 4.25%  | 8.56%  | 12.56% | 15.71% |
| All Ratings                           |  | 0.07%  | 0.26%  | 0.82%  | 1.69%  | 3.00%  | 4.14%  | 5.01%  |

Figure 47

**Multi-Year Cumulative Impairment Rates by Original Rating, 1993-2006**

| <b>US HEL &amp; RMBS</b>                 |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
|--|-------------------|--------|--------|--------|--------|--------|--------|--------|
|  | Aaa               | 0.00%  | 0.00%  | 0.00%  | 0.13%  | 0.63%  | 0.76%  | 0.76%  |
|  | Aa                | 0.00%  | 0.00%  | 0.00%  | 0.63%  | 0.75%  | 0.75%  | 0.75%  |
|  | A                 | 0.00%  | 0.04%  | 0.39%  | 0.78%  | 1.24%  | 1.66%  | 2.18%  |
|  | Baa               | 0.04%  | 0.24%  | 1.10%  | 4.57%  | 7.76%  | 10.46% | 11.06% |
|  | Ba                | 0.00%  | 0.70%  | 2.98%  | 7.38%  | 10.82% | 13.08% | 14.39% |
|  | B                 | 0.20%  | 1.92%  | 8.56%  | 14.55% | 16.56% | 20.57% | 22.44% |
|  | Caa               | NA     | NA     | NA     | NA     | NA     | NA     | NA     |
|  | Investment Grade  | 0.01%  | 0.07%  | 0.35%  | 1.45%  | 2.46%  | 3.22%  | 3.46%  |
|  | Speculative Grade | 0.05%  | 1.08%  | 4.91%  | 9.83%  | 12.80% | 15.61% | 17.09% |
|  | All Ratings       | 0.01%  | 0.16%  | 0.79%  | 2.33%  | 3.58%  | 4.63%  | 5.05%  |
| <b>US HEL (post-1998 vintages only)</b>  |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
|  | Aaa               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
|  | Aa                | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
|  | A                 | 0.00%  | 0.00%  | 0.13%  | 0.13%  | 0.68%  | 2.19%  | 2.19%  |
|  | Baa               | 0.00%  | 0.05%  | 0.55%  | 2.80%  | 9.16%  | 14.63% | 14.63% |
|  | Ba                | 0.00%  | 0.89%  | 6.97%  | 13.44% | 16.28% | 16.28% | 16.28% |
|  | B                 | 0.00%  | 0.00%  | 0.00%  | 30.77% | 30.77% | 44.62% | 44.62% |
|  | Caa               | NA     | NA     | NA     | NA     | NA     | NA     | NA     |
|  | Investment Grade  | 0.00%  | 0.02%  | 0.21%  | 0.87%  | 2.67%  | 4.64%  | 4.64%  |
|  | Speculative Grade | 0.00%  | 0.83%  | 5.97%  | 16.64% | 18.86% | 24.27% | 24.27% |
|  | All Ratings       | 0.00%  | 0.05%  | 0.39%  | 1.52%  | 3.35%  | 5.57%  | 5.57%  |
| <b>US RMBS (post-1998 vintages only)</b> |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
|  | Aaa               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
|  | Aa                | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
|  | A                 | 0.00%  | 0.12%  | 0.78%  | 1.25%  | 1.25%  | 1.25%  | 1.25%  |
|  | Baa               | 0.06%  | 0.06%  | 0.06%  | 2.15%  | 2.15%  | 2.15%  | 2.15%  |
|  | Ba                | 0.00%  | 0.00%  | 0.44%  | 4.80%  | 4.80%  | 4.80%  | 4.80%  |
|  | B                 | 0.00%  | 0.39%  | 2.21%  | 2.21%  | 2.21%  | 2.21%  | 2.21%  |
|  | Caa               | NA     | NA     | NA     | NA     | NA     | NA     | NA     |
|  | Investment Grade  | 0.01%  | 0.03%  | 0.15%  | 0.61%  | 0.61%  | 0.61%  | 0.61%  |
|  | Speculative Grade | 0.00%  | 0.16%  | 1.17%  | 3.81%  | 3.81%  | 3.81%  | 3.81%  |
|  | All Ratings       | 0.01%  | 0.05%  | 0.29%  | 1.07%  | 1.07%  | 1.07%  | 1.07%  |
| <b>Global CDOs</b>                       |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
|  | Aaa               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
|  | Aa                | 0.00%  | 0.00%  | 0.00%  | 0.40%  | 1.79%  | 1.79%  | 4.70%  |
|  | A                 | 0.07%  | 0.67%  | 1.38%  | 2.29%  | 4.12%  | 5.21%  | 5.21%  |
|  | Baa               | 0.06%  | 1.84%  | 7.53%  | 13.12% | 17.28% | 20.57% | 21.45% |
|  | Ba                | 0.30%  | 4.07%  | 10.22% | 16.07% | 20.52% | 21.73% | 21.73% |
|  | B                 | 0.00%  | 8.05%  | 29.68% | 44.80% | 49.54% | 59.63% | 59.63% |
|  | Caa               | NA     | NA     | NA     | NA     | NA     | NA     | NA     |
|  | Investment Grade  | 0.03%  | 0.62%  | 2.27%  | 4.14%  | 6.03%  | 7.24%  | 8.42%  |
|  | Speculative Grade | 0.26%  | 4.66%  | 13.19% | 20.72% | 25.37% | 30.29% | 30.29% |
|  | All Ratings       | 0.06%  | 1.07%  | 3.58%  | 6.26%  | 8.64%  | 10.43% | 11.46% |

Figure 47

**Multi-Year Cumulative Impairment Rates by Original Rating, 1993-2006**

| <b>Global CDOs excl. HYCBOs</b>                     |  | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
|---|--|--------|--------|--------|--------|--------|--------|--------|
| Aaa   |  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| Aa  |  | 0.00%  | 0.00%  | 0.00%  | 0.50%  | 1.99%  | 1.99%  | 1.99%  |
| A   |  | 0.07%  | 0.50%  | 0.96%  | 1.47%  | 2.58%  | 2.58%  | 2.58%  |
| Baa   |  | 0.07%  | 1.38%  | 4.44%  | 8.37%  | 10.80% | 10.80% | 10.80% |
| Ba  |  | 0.36%  | 1.62%  | 3.91%  | 8.04%  | 11.23% | 11.23% | 11.23% |
| B   |  | 0.00%  | 2.17%  | 7.93%  | 11.28% | 11.28% | 29.02% | 29.02% |
| Caa   |  | NA     | NA     | NA     | NA     | NA     | NA     | NA     |
| Investment Grade                                    |  | 0.03%  | 0.44%  | 1.30%  | 2.56%  | 3.79%  | 3.79%  | 3.79%  |
| Speculative Grade                                   |  | 0.32%  | 1.67%  | 4.32%  | 8.36%  | 10.95% | 16.23% | 16.23% |
| All Ratings   |  | 0.06%  | 0.56%  | 1.60%  | 3.20%  | 4.63%  | 5.47%  | 5.47%  |
| <b>European Structured Finance<br/>(excl. CDOs)</b> |  | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
| Aaa   |  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| Aa  |  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| A   |  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| Baa   |  | 0.00%  | 0.20%  | 0.20%  | 0.20%  | 0.20%  | 1.73%  | 1.73%  |
| Ba  |  | 0.00%  | 0.00%  | 0.00%  | 1.72%  | 1.72%  | 1.72%  | 1.72%  |
| B   |  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | NA     | NA     | NA     |
| Caa   |  | NA     | NA     | NA     | NA     | NA     | NA     | NA     |
| Investment Grade                                    |  | 0.00%  | 0.04%  | 0.04%  | 0.04%  | 0.04%  | 0.27%  | 0.27%  |
| Speculative Grade                                   |  | 0.00%  | 0.00%  | 0.00%  | 1.64%  | 1.64%  | 1.64%  | 1.64%  |
| All Ratings   |  | 0.00%  | 0.04%  | 0.04%  | 0.12%  | 0.12%  | 0.33%  | 0.33%  |



## Appendix 4: Principal Impairment Rates by Rating

Figure 48

### Multi-Year Cumulative Principal Impairment Rates by Cohort Rating, 1993-2006

| All Structured Finance         |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
|--------------------------------|-------------------|--------|--------|--------|--------|--------|--------|--------|
|                                | Aaa               | 0.03%  | 0.06%  | 0.15%  | 0.26%  | 0.33%  | 0.35%  | 0.35%  |
|                                | Aa                | 0.14%  | 0.43%  | 0.95%  | 1.62%  | 2.25%  | 2.66%  | 3.00%  |
|                                | A                 | 0.21%  | 0.74%  | 1.39%  | 2.05%  | 2.69%  | 3.25%  | 3.58%  |
|                                | Baa               | 0.90%  | 2.72%  | 5.23%  | 7.57%  | 10.37% | 13.09% | 15.80% |
|                                | Ba                | 2.84%  | 6.74%  | 10.61% | 14.44% | 16.50% | 18.01% | 19.26% |
|                                | B                 | 5.09%  | 9.93%  | 14.94% | 19.26% | 23.42% | 26.17% | 28.29% |
|                                | Caa               | 20.60% | 30.85% | 38.95% | 50.84% | 58.75% | 63.19% | 63.19% |
|                                | Investment Grade  | 0.29%  | 0.90%  | 1.75%  | 2.60%  | 3.53%  | 4.37%  | 5.15%  |
|                                | Speculative Grade | 4.59%  | 9.11%  | 13.52% | 17.72% | 20.64% | 22.66% | 24.18% |
|                                | All Ratings       | 0.81%  | 1.92%  | 3.22%  | 4.49%  | 5.67%  | 6.65%  | 7.52%  |
| US ABS                         |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
|                                | Aaa               | 0.07%  | 0.17%  | 0.38%  | 0.66%  | 0.82%  | 0.87%  | 0.87%  |
|                                | Aa                | 0.37%  | 1.17%  | 2.50%  | 4.09%  | 5.48%  | 6.20%  | 6.63%  |
|                                | A                 | 0.31%  | 1.21%  | 2.37%  | 3.49%  | 4.63%  | 5.63%  | 6.25%  |
|                                | Baa               | 1.38%  | 4.34%  | 8.89%  | 13.51% | 19.87% | 26.23% | 32.51% |
|                                | Ba                | 8.15%  | 19.46% | 29.96% | 41.66% | 47.27% | 51.37% | 55.47% |
|                                | B                 | 18.93% | 32.81% | 43.97% | 50.23% | 56.34% | 59.45% | 62.02% |
|                                | Caa               | 32.01% | 44.76% | 54.57% | 74.92% | 80.55% | 88.96% | 88.96% |
|                                | Investment Grade  | 0.49%  | 1.55%  | 3.09%  | 4.70%  | 6.61%  | 8.41%  | 10.10% |
|                                | Speculative Grade | 12.63% | 24.64% | 35.15% | 45.73% | 51.37% | 55.22% | 58.73% |
|                                | All Ratings       | 1.29%  | 3.05%  | 5.17%  | 7.35%  | 9.51%  | 11.44% | 13.23% |
| US ABS (excl. both MH and HEL) |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
|                                | Aaa               | 0.12%  | 0.20%  | 0.29%  | 0.40%  | 0.50%  | 0.53%  | 0.53%  |
|                                | Aa                | 1.03%  | 2.37%  | 3.69%  | 5.17%  | 6.90%  | 7.58%  | 7.58%  |
|                                | A                 | 0.17%  | 0.67%  | 1.35%  | 1.96%  | 2.65%  | 3.19%  | 3.41%  |
|                                | Baa               | 1.04%  | 2.72%  | 5.07%  | 7.43%  | 10.33% | 14.72% | 19.05% |
|                                | Ba                | 4.30%  | 12.37% | 18.72% | 24.99% | 32.09% | 40.12% | 46.94% |
|                                | B                 | 15.33% | 27.73% | 35.79% | 40.78% | 47.76% | 49.84% | 49.84% |
|                                | Caa               | 28.53% | 41.45% | 57.58% | NA     | NA     | NA     | NA     |
|                                | Investment Grade  | 0.32%  | 0.83%  | 1.48%  | 2.11%  | 2.82%  | 3.47%  | 3.91%  |
|                                | Speculative Grade | 10.42% | 20.00% | 27.43% | 35.31% | 41.97% | 48.11% | 52.09% |
|                                | All Ratings       | 0.85%  | 1.81%  | 2.74%  | 3.60%  | 4.46%  | 5.24%  | 5.74%  |
| US CMBS                        |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
|                                | Aaa               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
|                                | Aa                | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
|                                | A                 | 0.01%  | 0.06%  | 0.11%  | 0.11%  | 0.11%  | 0.11%  | 0.11%  |
|                                | Baa               | 0.09%  | 0.23%  | 0.35%  | 0.45%  | 0.57%  | 0.75%  | 1.08%  |
|                                | Ba                | 0.15%  | 0.49%  | 1.01%  | 1.17%  | 1.17%  | 1.17%  | 1.17%  |
|                                | B                 | 1.52%  | 4.06%  | 8.12%  | 13.22% | 19.21% | 24.53% | 29.45% |
|                                | Caa               | 14.20% | 26.84% | 37.37% | 47.64% | 57.91% | 63.88% | 63.88% |
|                                | Investment Grade  | 0.03%  | 0.09%  | 0.15%  | 0.19%  | 0.23%  | 0.29%  | 0.41%  |
|                                | Speculative Grade | 1.47%  | 3.38%  | 5.99%  | 8.97%  | 12.42% | 15.41% | 17.97% |
|                                | All Ratings       | 0.45%  | 1.06%  | 1.85%  | 2.72%  | 3.68%  | 4.49%  | 5.19%  |

Figure 48

**Multi-Year Cumulative Principal Impairment Rates by Cohort Rating, 1993-2006**

|  | 1-Year  | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
|--|---------|--------|--------|--------|--------|--------|--------|
| <b>US HEL &amp; RMBS</b>                 |         |        |        |        |        |        |        |
| Aaa                                      | 0.00%   | 0.05%  | 0.15%  | 0.30%  | 0.35%  | 0.38%  | 0.38%  |
| Aa                                       | 0.01%   | 0.05%  | 0.18%  | 0.32%  | 0.35%  | 0.35%  | 0.35%  |
| A  | 0.12%   | 0.41%  | 0.72%  | 1.04%  | 1.31%  | 1.69%  | 2.11%  |
| Baa                                      | 0.63%   | 2.07%  | 4.23%  | 6.49%  | 8.32%  | 9.51%  | 10.49% |
| Ba                                       | 2.16%   | 5.04%  | 8.15%  | 10.66% | 12.47% | 13.66% | 14.59% |
| B  | 5.05%   | 9.52%  | 13.75% | 16.40% | 18.59% | 19.87% | 20.83% |
| Caa                                      | 32.16%  | 41.14% | 45.59% | 51.26% | 55.81% | 60.20% | 60.20% |
| Investment Grade                         | 0.18%   | 0.58%  | 1.19%  | 1.83%  | 2.30%  | 2.63%  | 2.92%  |
| Speculative Grade                        | 3.51%   | 7.02%  | 10.53% | 13.13% | 15.10% | 16.36% | 17.29% |
| All Ratings                              | 0.50%   | 1.23%  | 2.16%  | 3.05%  | 3.71%  | 4.17%  | 4.54%  |
| <b>US HEL (post-1998 vintages only)</b>  |         |        |        |        |        |        |        |
| Aaa                                      | 0.00%   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| Aa                                       | 0.00%   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| A  | 0.00%   | 0.07%  | 0.35%  | 0.77%  | 1.37%  | 1.66%  | 1.66%  |
| Baa                                      | 0.31%   | 1.40%  | 3.80%  | 8.30%  | 13.32% | 16.08% | 16.08% |
| Ba                                       | 1.70%   | 5.32%  | 10.71% | 13.79% | 15.30% | 15.30% | 15.30% |
| B  | 15.89%  | 25.06% | 35.71% | 45.96% | 51.32% | 52.27% | 52.27% |
| Caa                                      | 46.41%  | 55.20% | 55.20% | 55.20% | NA     | NA     | NA     |
| Investment Grade                         | 0.10%   | 0.46%  | 1.25%  | 2.61%  | 4.20%  | 5.17%  | 5.17%  |
| Speculative Grade                        | 3.74%   | 8.37%  | 14.99% | 20.12% | 23.03% | 23.47% | 23.47% |
| All Ratings                              | 0.28%   | 0.82%  | 1.89%  | 3.49%  | 5.19%  | 6.12%  | 6.12%  |
| <b>US RMBS (post-1998 vintages only)</b> |         |        |        |        |        |        |        |
| Aaa                                      | 0.00%   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| Aa                                       | 0.00%   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| A  | 0.17%   | 0.48%  | 0.64%  | 0.79%  | 0.79%  | 0.79%  | 0.79%  |
| Baa                                      | 0.10%   | 0.49%  | 1.37%  | 2.72%  | 2.72%  | 2.72%  | 2.72%  |
| Ba                                       | 0.47%   | 1.54%  | 3.54%  | 5.95%  | 5.95%  | 5.95%  | 5.95%  |
| B  | 1.10%   | 2.06%  | 3.23%  | 3.63%  | 3.63%  | 3.63%  | 3.63%  |
| Caa                                      | 100.00% | NA     | NA     | NA     | NA     | NA     | NA     |
| Investment Grade                         | 0.05%   | 0.17%  | 0.35%  | 0.62%  | 0.62%  | 0.62%  | 0.62%  |
| Speculative Grade                        | 0.76%   | 1.79%  | 3.45%  | 5.08%  | 5.08%  | 5.08%  | 5.08%  |
| All Ratings                              | 0.13%   | 0.37%  | 0.76%  | 1.23%  | 1.23%  | 1.23%  | 1.23%  |
| <b>Global CDOs</b>                       |         |        |        |        |        |        |        |
| Aaa                                      | 0.00%   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| Aa                                       | 0.02%   | 0.11%  | 0.51%  | 1.45%  | 3.04%  | 5.36%  | 8.91%  |
| A  | 0.28%   | 0.93%  | 1.63%  | 2.86%  | 3.91%  | 6.38%  | 8.24%  |
| Baa                                      | 1.77%   | 5.29%  | 9.59%  | 13.03% | 15.88% | 17.77% | 19.78% |
| Ba                                       | 3.24%   | 7.99%  | 13.02% | 17.03% | 19.45% | 20.92% | 24.48% |
| B  | 9.86%   | 19.60% | 29.21% | 37.09% | 42.96% | 44.30% | 44.30% |
| Caa                                      | 17.14%  | 24.60% | 30.14% | 43.42% | 61.43% | 61.43% | NA     |
| Investment Grade                         | 0.54%   | 1.69%  | 3.19%  | 4.70%  | 6.18%  | 7.84%  | 10.09% |
| Speculative Grade                        | 6.08%   | 12.22% | 18.33% | 23.47% | 27.07% | 28.53% | 30.63% |
| All Ratings                              | 1.46%   | 3.50%  | 5.83%  | 7.97%  | 9.80%  | 11.42% | 13.62% |

Figure 48

**Multi-Year Cumulative Principal Impairment Rates by Cohort Rating, 1993-2006**

| Global CDOs excl. HYCBOs | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year  | 6-Year | 7-Year |
|--------------------------|--------|--------|--------|--------|---------|--------|--------|
| Aaa                      | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%   | 0.00%  | 0.00%  |
| Aa                       | 0.02%  | 0.13%  | 0.36%  | 0.78%  | 1.31%   | 1.31%  | 1.31%  |
| A                        | 0.24%  | 0.76%  | 1.24%  | 2.10%  | 2.58%   | 3.17%  | 3.17%  |
| Baa                      | 1.02%  | 3.20%  | 5.80%  | 7.92%  | 8.95%   | 9.82%  | 11.91% |
| Ba                       | 1.35%  | 3.41%  | 5.92%  | 8.81%  | 10.23%  | 12.41% | 18.04% |
| B                        | 6.28%  | 11.86% | 16.84% | 22.22% | 29.66%  | 32.24% | 32.24% |
| Caa                      | 14.99% | 19.70% | 23.84% | 39.46% | 100.00% | NA     | NA     |
| Investment Grade         | 0.32%  | 1.03%  | 1.90%  | 2.79%  | 3.33%   | 3.76%  | 4.69%  |
| Speculative Grade        | 3.30%  | 6.19%  | 9.25%  | 12.84% | 16.25%  | 18.60% | 22.36% |
| All Ratings              | 0.73%  | 1.79%  | 3.00%  | 4.30%  | 5.31%   | 6.03%  | 7.33%  |

Figure 49

**Multi-Year Cumulative Principal Impairment Rates by Original Rating, 1993-2006**

| <b>All Structured Finance</b>         |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
|---------------------------------------|-------------------|--------|--------|--------|--------|--------|--------|--------|
|                                       | Aaa               | 0.06%  | 0.10%  | 0.12%  | 0.23%  | 0.49%  | 0.59%  | 0.59%  |
|                                       | Aa                | 0.09%  | 0.27%  | 0.47%  | 1.20%  | 2.39%  | 2.99%  | 3.57%  |
|                                       | A                 | 0.02%  | 0.21%  | 0.76%  | 1.52%  | 2.39%  | 3.37%  | 3.67%  |
|                                       | Baa               | 0.04%  | 0.62%  | 2.61%  | 5.63%  | 8.27%  | 11.28% | 13.40% |
|                                       | Ba                | 0.17%  | 2.04%  | 5.44%  | 9.26%  | 12.26% | 14.11% | 15.81% |
|                                       | B                 | 0.14%  | 1.85%  | 7.54%  | 12.84% | 17.92% | 22.51% | 25.38% |
|                                       | Caa               | 1.79%  | 1.79%  | 5.12%  | 8.84%  | 22.51% | 44.65% | 44.65% |
|                                       | Investment Grade  | 0.05%  | 0.29%  | 0.94%  | 2.00%  | 3.14%  | 4.23%  | 4.94%  |
|                                       | Speculative Grade | 0.18%  | 1.98%  | 6.12%  | 10.41% | 14.27% | 17.47% | 19.57% |
|                                       | All Ratings       | 0.07%  | 0.47%  | 1.51%  | 2.97%  | 4.45%  | 5.82%  | 6.71%  |
| <b>US ABS</b>                         |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
|                                       | Aaa               | 0.18%  | 0.26%  | 0.34%  | 0.59%  | 1.17%  | 1.39%  | 1.39%  |
|                                       | Aa                | 0.24%  | 0.78%  | 1.37%  | 3.28%  | 6.23%  | 7.98%  | 8.83%  |
|                                       | A                 | 0.02%  | 0.23%  | 1.10%  | 2.49%  | 3.88%  | 5.57%  | 6.17%  |
|                                       | Baa               | 0.04%  | 0.73%  | 3.30%  | 8.06%  | 13.42% | 19.77% | 24.88% |
|                                       | Ba                | 0.42%  | 6.04%  | 15.87% | 24.14% | 34.09% | 37.65% | 44.58% |
|                                       | B                 | 1.09%  | 9.69%  | 36.65% | 48.86% | 50.65% | 59.24% | 62.05% |
|                                       | Caa               | NA     | NA     | NA     | NA     | NA     | NA     | NA     |
|                                       | Investment Grade  | 0.11%  | 0.46%  | 1.41%  | 3.19%  | 5.32%  | 7.47%  | 8.91%  |
|                                       | Speculative Grade | 0.57%  | 6.61%  | 19.89% | 29.05% | 37.06% | 42.25% | 48.08% |
|                                       | All Ratings       | 0.14%  | 0.74%  | 2.21%  | 4.36%  | 6.79%  | 9.12%  | 10.78% |
| <b>US ABS (excl. both MH and HEL)</b> |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
|                                       | Aaa               | 0.37%  | 0.53%  | 0.65%  | 0.80%  | 0.92%  | 1.09%  | 1.09%  |
|                                       | Aa                | 1.64%  | 3.39%  | 4.63%  | 5.93%  | 8.50%  | 12.14% | 12.14% |
|                                       | A                 | 0.06%  | 0.31%  | 1.09%  | 1.91%  | 2.80%  | 3.55%  | 3.84%  |
|                                       | Baa               | 0.15%  | 1.02%  | 4.31%  | 6.41%  | 7.87%  | 11.12% | 13.85% |
|                                       | Ba                | 0.53%  | 6.16%  | 12.60% | 18.88% | 24.82% | 27.50% | 40.11% |
|                                       | B                 | 0.00%  | 8.00%  | 38.67% | 38.67% | 38.67% | 38.67% | 38.67% |
|                                       | Caa               | NA     | NA     | NA     | NA     | NA     | NA     | NA     |
|                                       | Investment Grade  | 0.36%  | 0.78%  | 1.61%  | 2.32%  | 3.06%  | 4.03%  | 4.39%  |
|                                       | Speculative Grade | 0.91%  | 6.80%  | 16.47% | 21.92% | 26.95% | 29.24% | 39.00% |
|                                       | All Ratings       | 0.38%  | 1.02%  | 2.17%  | 3.05%  | 3.91%  | 4.93%  | 5.50%  |
| <b>US CMBS</b>                        |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
|                                       | Aaa               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
|                                       | Aa                | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
|                                       | A                 | 0.00%  | 0.00%  | 0.17%  | 0.17%  | 0.17%  | 0.17%  | 0.17%  |
|                                       | Baa               | 0.00%  | 0.17%  | 0.41%  | 0.58%  | 0.58%  | 0.58%  | 0.58%  |
|                                       | Ba                | 0.00%  | 0.00%  | 0.60%  | 1.13%  | 1.13%  | 1.13%  | 1.13%  |
|                                       | B                 | 0.14%  | 0.49%  | 1.86%  | 5.08%  | 12.24% | 16.17% | 20.93% |
|                                       | Caa               | 0.00%  | 0.00%  | 3.85%  | 8.12%  | 23.43% | 48.96% | 48.96% |
|                                       | Investment Grade  | 0.00%  | 0.07%  | 0.20%  | 0.26%  | 0.26%  | 0.26%  | 0.26%  |
|                                       | Speculative Grade | 0.06%  | 0.22%  | 1.26%  | 3.14%  | 7.08%  | 10.20% | 12.51% |
|                                       | All Ratings       | 0.02%  | 0.11%  | 0.51%  | 1.14%  | 2.33%  | 3.21%  | 3.84%  |

Figure 49

**Multi-Year Cumulative Principal Impairment Rates by Original Rating, 1993-2006**

| US HEL & RMBS                            |                   | 1-Year        | 2-Year        | 3-Year        | 4-Year        | 5-Year        | 6-Year        | 7-Year        |
|--|-------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
|  | Aaa               | 0.00%         | 0.00%         | 0.00%         | 0.13%         | 0.63%         | 0.76%         | 0.76%         |
|  | Aa                | 0.00%         | 0.00%         | 0.00%         | 0.63%         | 0.75%         | 0.75%         | 0.75%         |
|  | A                 | 0.00%         | 0.04%         | 0.39%         | 0.78%         | 1.24%         | 1.66%         | 2.18%         |
|  | Baa               | 0.04%         | 0.24%         | 1.05%         | 4.52%         | 7.71%         | 10.42%        | 11.02%        |
|  | Ba                | 0.00%         | 0.70%         | 2.98%         | 7.15%         | 10.58%        | 12.84%        | 14.15%        |
|  | B                 | 0.20%         | 1.92%         | 8.56%         | 14.55%        | 16.56%        | 20.57%        | 22.44%        |
|  | Caa               | NA            | NA            | NA            | NA            | NA            | NA            | NA            |
|  | Investment Grade  | 0.01%         | 0.07%         | 0.34%         | 1.44%         | 2.44%         | 3.21%         | 3.45%         |
|  | Speculative Grade | 0.05%         | 1.08%         | 4.91%         | 9.68%         | 12.65%        | 15.45%        | 16.93%        |
|  | All Ratings       | 0.01%         | 0.16%         | 0.78%         | 2.30%         | 3.56%         | 4.60%         | 5.02%         |
| <b>US HEL (post-1998 vintages only)</b>  |                   | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-Year</b> | <b>6-Year</b> | <b>7-Year</b> |
|  | Aaa               | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
|  | Aa                | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
|  | A                 | 0.00%         | 0.00%         | 0.13%         | 0.13%         | 0.68%         | 2.19%         | 2.19%         |
|  | Baa               | 0.00%         | 0.05%         | 0.45%         | 2.70%         | 9.07%         | 14.54%        | 14.54%        |
|  | Ba                | 0.00%         | 0.89%         | 6.97%         | 11.82%        | 14.62%        | 14.62%        | 14.62%        |
|  | B                 | 0.00%         | 0.00%         | 0.00%         | 30.77%        | 30.77%        | 44.62%        | 44.62%        |
|  | Caa               | NA            | NA            | NA            | NA            | NA            | NA            | NA            |
|  | Investment Grade  | 0.00%         | 0.02%         | 0.18%         | 0.84%         | 2.63%         | 4.61%         | 4.61%         |
|  | Speculative Grade | 0.00%         | 0.83%         | 5.97%         | 15.31%        | 17.51%        | 22.66%        | 22.66%        |
|  | All Ratings       | 0.00%         | 0.05%         | 0.36%         | 1.43%         | 3.26%         | 5.47%         | 5.47%         |
| <b>US RMBS (post-1998 vintages only)</b> |                   | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-Year</b> | <b>6-Year</b> | <b>7-Year</b> |
|  | Aaa               | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
|  | Aa                | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
|  | A                 | 0.00%         | 0.12%         | 0.78%         | 1.25%         | 1.25%         | 1.25%         | 1.25%         |
|  | Baa               | 0.06%         | 0.06%         | 0.06%         | 2.15%         | 2.15%         | 2.15%         | 2.15%         |
|  | Ba                | 0.00%         | 0.00%         | 0.44%         | 4.80%         | 4.80%         | 4.80%         | 4.80%         |
|  | B                 | 0.00%         | 0.39%         | 2.21%         | 2.21%         | 2.21%         | 2.21%         | 2.21%         |
|  | Caa               | NA            | NA            | NA            | NA            | NA            | NA            | NA            |
|  | Investment Grade  | 0.01%         | 0.03%         | 0.15%         | 0.61%         | 0.61%         | 0.61%         | 0.61%         |
|  | Speculative Grade | 0.00%         | 0.16%         | 1.17%         | 3.81%         | 3.81%         | 3.81%         | 3.81%         |
|  | All Ratings       | 0.01%         | 0.05%         | 0.29%         | 1.07%         | 1.07%         | 1.07%         | 1.07%         |
| <b>Global CDOs</b>                       |                   | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-Year</b> | <b>6-Year</b> | <b>7-Year</b> |
|  | Aaa               | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
|  | Aa                | 0.00%         | 0.00%         | 0.00%         | 0.20%         | 1.24%         | 1.24%         | 4.16%         |
|  | A                 | 0.00%         | 0.50%         | 0.93%         | 1.38%         | 3.19%         | 4.24%         | 4.24%         |
|  | Baa               | 0.06%         | 1.68%         | 6.69%         | 11.79%        | 15.64%        | 18.84%        | 19.69%        |
|  | Ba                | 0.30%         | 3.68%         | 9.33%         | 15.15%        | 19.08%        | 20.25%        | 20.25%        |
|  | B                 | 0.00%         | 8.05%         | 28.33%        | 43.42%        | 48.13%        | 56.11%        | 56.11%        |
|  | Caa               | NA            | NA            | NA            | NA            | NA            | NA            | NA            |
|  | Investment Grade  | 0.02%         | 0.53%         | 1.95%         | 3.55%         | 5.27%         | 6.47%         | 7.63%         |
|  | Speculative Grade | 0.26%         | 4.32%         | 12.22%        | 19.71%        | 23.95%        | 27.93%        | 27.93%        |
|  | All Ratings       | 0.04%         | 0.96%         | 3.18%         | 5.63%         | 7.79%         | 9.43%         | 10.45%        |

Figure 49

**Multi-Year Cumulative Principal Impairment Rates by Original Rating, 1993-2006**

| Global CDOs excl. HYCBOs |  | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
|--------------------------|--|--------|--------|--------|--------|--------|--------|--------|
| Aaa                      |  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| Aa                       |  | 0.00%  | 0.00%  | 0.00%  | 0.25%  | 1.24%  | 1.24%  | 1.24%  |
| A                        |  | 0.00%  | 0.43%  | 0.74%  | 1.24%  | 2.35%  | 2.35%  | 2.35%  |
| Baa                      |  | 0.07%  | 1.38%  | 4.03%  | 7.95%  | 9.97%  | 9.97%  | 9.97%  |
| Ba                       |  | 0.36%  | 1.37%  | 3.66%  | 7.78%  | 10.17% | 10.17% | 10.17% |
| B                        |  | 0.00%  | 2.17%  | 7.93%  | 11.28% | 11.28% | 29.02% | 29.02% |
| Caa                      |  | NA     | NA     | NA     | NA     | NA     | NA     | NA     |
| Investment Grade         |  | 0.02%  | 0.43%  | 1.14%  | 2.35%  | 3.36%  | 3.36%  | 3.36%  |
| Speculative Grade        |  | 0.32%  | 1.45%  | 4.10%  | 8.13%  | 10.07% | 15.36% | 15.36% |
| All Ratings              |  | 0.05%  | 0.53%  | 1.44%  | 2.99%  | 4.13%  | 4.97%  | 4.97%  |

## Appendix 5: Estimated Historical Average Loss Rates by Rating<sup>37</sup>

Figure 50  
Multi-Year Cumulative Loss Rates by Cohort Rating, 1993-2006

| All Structured Finance         |  | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
|--------------------------------|--|--------|--------|--------|--------|--------|--------|--------|
| Aaa                            |  | 0.02%  | 0.03%  | 0.03%  | 0.04%  | 0.04%  | 0.04%  | 0.04%  |
| Aa                             |  | 0.12%  | 0.30%  | 0.59%  | 0.93%  | 1.22%  | 1.37%  | 1.47%  |
| A                              |  | 0.12%  | 0.47%  | 0.85%  | 1.20%  | 1.51%  | 1.70%  | 1.74%  |
| Baa                            |  | 0.58%  | 1.66%  | 2.96%  | 3.90%  | 4.93%  | 5.78%  | 6.44%  |
| Ba                             |  | 1.98%  | 4.27%  | 6.19%  | 7.89%  | 8.49%  | 8.77%  | 8.84%  |
| B                              |  | 3.50%  | 6.69%  | 9.66%  | 11.49% | 12.80% | 13.71% | 14.47% |
| Caa                            |  | 13.69% | 19.49% | 23.95% | 30.14% | 32.75% | 34.21% | 34.21% |
| Investment Grade               |  | 0.19%  | 0.56%  | 0.99%  | 1.35%  | 1.70%  | 1.97%  | 2.15%  |
| Speculative Grade              |  | 3.16%  | 5.92%  | 8.28%  | 10.14% | 11.00% | 11.46% | 11.66% |
| All Ratings                    |  | 0.55%  | 1.23%  | 1.92%  | 2.50%  | 2.94%  | 3.28%  | 3.55%  |
| US ABS                         |  | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
| Aaa                            |  | 0.05%  | 0.07%  | 0.09%  | 0.10%  | 0.11%  | 0.11%  | 0.11%  |
| Aa                             |  | 0.34%  | 0.86%  | 1.62%  | 2.42%  | 3.09%  | 3.38%  | 3.50%  |
| A                              |  | 0.21%  | 0.83%  | 1.52%  | 2.13%  | 2.73%  | 3.06%  | 3.12%  |
| Baa                            |  | 0.89%  | 2.61%  | 4.81%  | 6.66%  | 9.07%  | 11.16% | 12.86% |
| Ba                             |  | 5.85%  | 12.77% | 18.53% | 24.37% | 26.54% | 27.64% | 27.98% |
| B                              |  | 13.29% | 22.46% | 28.51% | 30.81% | 31.75% | 32.04% | 32.10% |
| Caa                            |  | 21.40% | 27.29% | 27.90% | 29.07% | 29.09% | 29.11% | 29.11% |
| Investment Grade               |  | 0.33%  | 0.97%  | 1.74%  | 2.40%  | 3.15%  | 3.74%  | 4.18%  |
| Speculative Grade              |  | 8.91%  | 16.31% | 21.95% | 26.94% | 28.60% | 29.33% | 29.58% |
| All Ratings                    |  | 0.90%  | 1.99%  | 3.10%  | 4.09%  | 4.92%  | 5.59%  | 6.14%  |
| US ABS (excl. both MH and HEL) |  | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
| Aaa                            |  | 0.09%  | 0.10%  | 0.11%  | 0.12%  | 0.12%  | 0.12%  | 0.12%  |
| Aa                             |  | 0.94%  | 1.81%  | 2.57%  | 3.31%  | 4.15%  | 4.43%  | 4.43%  |
| A                              |  | 0.11%  | 0.45%  | 0.86%  | 1.20%  | 1.56%  | 1.73%  | 1.76%  |
| Baa                            |  | 0.67%  | 1.64%  | 2.79%  | 3.73%  | 4.83%  | 6.27%  | 7.44%  |
| Ba                             |  | 3.08%  | 8.02%  | 11.51% | 14.64% | 17.39% | 19.54% | 20.11% |
| B                              |  | 10.77% | 18.95% | 23.32% | 25.16% | 26.23% | 26.42% | 26.42% |
| Caa                            |  | 19.08% | 25.04% | 26.05% | NA     | NA     | NA     | NA     |
| Investment Grade               |  | 0.21%  | 0.52%  | 0.85%  | 1.11%  | 1.39%  | 1.60%  | 1.71%  |
| Speculative Grade              |  | 7.35%  | 13.26% | 17.24% | 20.96% | 22.92% | 24.09% | 24.38% |
| All Ratings                    |  | 0.59%  | 1.18%  | 1.67%  | 2.06%  | 2.40%  | 2.67%  | 2.82%  |
| US CMBS                        |  | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
| Aaa                            |  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| Aa                             |  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| A                              |  | 0.00%  | 0.02%  | 0.04%  | 0.04%  | 0.04%  | 0.04%  | 0.04%  |
| Baa                            |  | 0.04%  | 0.09%  | 0.13%  | 0.15%  | 0.17%  | 0.19%  | 0.21%  |
| Ba                             |  | 0.07%  | 0.21%  | 0.38%  | 0.43%  | 0.43%  | 0.43%  | 0.43%  |
| B                              |  | 0.93%  | 2.48%  | 4.70%  | 6.93%  | 8.97%  | 11.02% | 12.79% |
| Caa                            |  | 9.03%  | 15.98% | 22.37% | 27.70% | 27.73% | 27.74% | 27.74% |

37. Historical average loss rates are calculated by multiplying together average multi-year cumulative principal impairment rates and multi-year LGD rates for each rating and time horizon. The final LGD rates of unresolved and principal-impaired tranches are estimated. The average multi-year LGD rates by rating are based on a combined sample of both resolved and unresolved principal impairments. These LGD rates can be found by dividing the average multi-year loss rates in Appendix 5 by the average multi-year cumulative principal impairment rates in Appendix 4. The number of impaired securities in certain rating buckets and at some longer time horizons is very small (some are less than five). As a result, the average LGD rates are subject to small sample variations. The average LGD rates are generally lower, and sometimes substantially lower, over long horizons than over short horizons because of discounting and principal amortization. Please refer to the LGD section of this report for more discussions.

Figure 50

**Multi-Year Cumulative Loss Rates by Cohort Rating, 1993-2006**

|  |  |                   |        |        |        |        |        |        |        |
|--|--|-------------------|--------|--------|--------|--------|--------|--------|--------|
| <b>US CMBS (continued)</b>               |  | Investment Grade  | 0.01%  | 0.04%  | 0.05%  | 0.06%  | 0.07%  | 0.07%  | 0.08%  |
|  |  | Speculative Grade | 0.83%  | 1.80%  | 2.96%  | 4.08%  | 5.06%  | 5.69%  | 6.04%  |
|  |  | All Ratings       | 0.24%  | 0.50%  | 0.80%  | 1.05%  | 1.25%  | 1.37%  | 1.42%  |
| <b>US HEL &amp; RMBS</b>                 |  |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
|  |  | Aaa               | 0.00%  | 0.01%  | 0.01%  | 0.02%  | 0.02%  | 0.02%  | 0.02%  |
|  |  | Aa                | 0.00%  | 0.01%  | 0.03%  | 0.06%  | 0.06%  | 0.06%  | 0.06%  |
|  |  | A                 | 0.05%  | 0.16%  | 0.25%  | 0.32%  | 0.37%  | 0.43%  | 0.45%  |
|  |  | Baa               | 0.27%  | 0.82%  | 1.49%  | 2.01%  | 2.30%  | 2.42%  | 2.47%  |
|  |  | Ba                | 1.04%  | 2.19%  | 3.21%  | 3.99%  | 4.45%  | 4.59%  | 4.63%  |
|  |  | B                 | 2.89%  | 5.43%  | 7.53%  | 8.49%  | 8.88%  | 8.97%  | 8.99%  |
|  |  | Caa               | 18.20% | 20.26% | 20.54% | 20.87% | 20.96% | 21.05% | 21.05% |
|  |  | Investment Grade  | 0.07%  | 0.23%  | 0.40%  | 0.54%  | 0.61%  | 0.64%  | 0.66%  |
|  |  | Speculative Grade | 1.88%  | 3.49%  | 4.86%  | 5.69%  | 6.13%  | 6.25%  | 6.29%  |
|  |  | All Ratings       | 0.25%  | 0.55%  | 0.87%  | 1.10%  | 1.22%  | 1.27%  | 1.29%  |
| <b>US HEL (post-1998 vintages only)</b>  |  |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
|  |  | Aaa               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
|  |  | Aa                | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
|  |  | A                 | 0.00%  | 0.03%  | 0.11%  | 0.20%  | 0.32%  | 0.36%  | 0.36%  |
|  |  | Baa               | 0.13%  | 0.55%  | 1.30%  | 2.33%  | 3.12%  | 3.39%  | 3.39%  |
|  |  | Ba                | 0.82%  | 2.26%  | 4.03%  | 4.99%  | 5.37%  | 5.37%  | 5.37%  |
|  |  | B                 | 9.10%  | 14.32% | 19.59% | 23.31% | 24.27% | 24.33% | 24.33% |
|  |  | Caa               | 26.26% | 28.28% | 28.28% | 28.28% | NA     | NA     | NA     |
|  |  | Investment Grade  | 0.04%  | 0.18%  | 0.40%  | 0.69%  | 0.94%  | 1.03%  | 1.03%  |
|  |  | Speculative Grade | 2.00%  | 4.13%  | 6.72%  | 8.35%  | 8.99%  | 9.04%  | 9.04%  |
|  |  | All Ratings       | 0.14%  | 0.36%  | 0.73%  | 1.14%  | 1.45%  | 1.55%  | 1.55%  |
| <b>US RMBS (post-1998 vintages only)</b> |  |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
|  |  | Aaa               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
|  |  | Aa                | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
|  |  | A                 | 0.07%  | 0.19%  | 0.24%  | 0.27%  | 0.27%  | 0.27%  | 0.27%  |
|  |  | Baa               | 0.04%  | 0.19%  | 0.47%  | 0.77%  | 0.77%  | 0.77%  | 0.77%  |
|  |  | Ba                | 0.23%  | 0.65%  | 1.31%  | 2.06%  | 2.06%  | 2.06%  | 2.06%  |
|  |  | B                 | 0.63%  | 1.18%  | 1.76%  | 1.90%  | 1.90%  | 1.90%  | 1.90%  |
|  |  | Caa               | 56.57% | NA     | NA     | NA     | NA     | NA     | NA     |
|  |  | Investment Grade  | 0.02%  | 0.07%  | 0.12%  | 0.18%  | 0.18%  | 0.18%  | 0.18%  |
|  |  | Speculative Grade | 0.41%  | 0.88%  | 1.53%  | 2.05%  | 2.05%  | 2.05%  | 2.05%  |
|  |  | All Ratings       | 0.06%  | 0.16%  | 0.30%  | 0.42%  | 0.42%  | 0.42%  | 0.42%  |
| <b>Global CDOs</b>                       |  |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
|  |  | Aaa               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
|  |  | Aa                | 0.02%  | 0.10%  | 0.34%  | 0.86%  | 1.28%  | 1.78%  | 1.78%  |
|  |  | A                 | 0.16%  | 0.49%  | 0.81%  | 1.57%  | 2.09%  | 2.22%  | 2.22%  |
|  |  | Baa               | 1.38%  | 3.92%  | 6.92%  | 8.96%  | 10.48% | 11.35% | 12.15% |
|  |  | Ba                | 2.62%  | 5.82%  | 8.96%  | 10.57% | 11.31% | 11.75% | 12.46% |
|  |  | B                 | 7.09%  | 13.79% | 20.11% | 23.10% | 24.41% | 24.42% | 24.42% |
|  |  | Caa               | 9.71%  | 13.07% | 14.28% | 14.28% | 14.28% | 14.28% | NA     |
|  |  | Investment Grade  | 0.41%  | 1.23%  | 2.26%  | 3.15%  | 3.91%  | 4.53%  | 5.21%  |
|  |  | Speculative Grade | 4.44%  | 8.52%  | 12.37% | 14.37% | 15.28% | 15.29% | 15.31% |
|  |  | All Ratings       | 1.09%  | 2.49%  | 4.02%  | 5.23%  | 6.18%  | 7.08%  | 8.50%  |



Figure 50

**Multi-Year Cumulative Loss Rates by Cohort Rating, 1993-2006**

| Global CDOs excl. HYCBOs | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
|--------------------------|--------|--------|--------|--------|--------|--------|--------|
| Aaa                      | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| Aa                       | 0.02%  | 0.11%  | 0.26%  | 0.49%  | 0.63%  | 0.63%  | 0.63%  |
| A                        | 0.13%  | 0.40%  | 0.62%  | 1.15%  | 1.39%  | 1.42%  | 1.42%  |
| Baa                      | 0.80%  | 2.37%  | 4.18%  | 5.44%  | 5.99%  | 6.39%  | 7.22%  |
| Ba                       | 1.09%  | 2.48%  | 4.05%  | 5.21%  | 5.64%  | 6.30%  | 7.42%  |
| B                        | 4.52%  | 8.36%  | 11.63% | 13.67% | 15.33% | 15.35% | 15.35% |
| Caa                      | 8.50%  | 10.61% | 11.52% | 11.52% | 11.52% | NA     | NA     |
| Investment Grade         | 0.24%  | 0.75%  | 1.35%  | 1.87%  | 2.15%  | 2.31%  | 2.59%  |
| Speculative Grade        | 2.41%  | 4.33%  | 6.26%  | 7.65%  | 8.51%  | 8.53%  | 8.57%  |
| All Ratings              | 0.54%  | 1.27%  | 2.06%  | 2.80%  | 3.33%  | 3.73%  | 4.56%  |

Figure 51

**Multi-Year Cumulative Loss Rates by Original Rating, 1993-2006**

| <b>All Structured Finance</b>         |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
|---------------------------------------|-------------------|--------|--------|--------|--------|--------|--------|--------|
|                                       | Aaa               | 0.05%  | 0.07%  | 0.09%  | 0.14%  | 0.17%  | 0.17%  | 0.17%  |
|                                       | Aa                | 0.09%  | 0.26%  | 0.41%  | 0.72%  | 1.35%  | 1.66%  | 1.84%  |
|                                       | A                 | 0.00%  | 0.08%  | 0.42%  | 0.88%  | 1.34%  | 1.79%  | 1.85%  |
|                                       | Baa               | 0.03%  | 0.38%  | 1.70%  | 3.21%  | 4.21%  | 5.27%  | 6.10%  |
|                                       | Ba                | 0.16%  | 1.47%  | 3.52%  | 5.23%  | 6.53%  | 7.05%  | 7.36%  |
|                                       | B                 | 0.13%  | 1.28%  | 5.42%  | 8.30%  | 10.60% | 11.55% | 13.39% |
|                                       | Caa               | 1.43%  | 1.43%  | 4.25%  | 7.23%  | 18.25% | 35.96% | 35.96% |
|                                       | Investment Grade  | 0.04%  | 0.19%  | 0.62%  | 1.15%  | 1.61%  | 2.01%  | 2.27%  |
|                                       | Speculative Grade | 0.17%  | 1.42%  | 4.17%  | 6.24%  | 8.01%  | 8.77%  | 9.31%  |
|                                       | All Ratings       | 0.06%  | 0.32%  | 1.01%  | 1.73%  | 2.36%  | 2.82%  | 3.12%  |
| <b>US ABS</b>                         |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
|                                       | Aaa               | 0.13%  | 0.20%  | 0.25%  | 0.35%  | 0.44%  | 0.44%  | 0.44%  |
|                                       | Aa                | 0.24%  | 0.74%  | 1.20%  | 2.03%  | 3.67%  | 4.56%  | 4.89%  |
|                                       | A                 | 0.01%  | 0.15%  | 0.74%  | 1.59%  | 2.24%  | 3.12%  | 3.23%  |
|                                       | Baa               | 0.01%  | 0.52%  | 2.33%  | 4.51%  | 6.54%  | 8.67%  | 10.83% |
|                                       | Ba                | 0.39%  | 4.59%  | 10.93% | 15.48% | 20.76% | 22.25% | 23.99% |
|                                       | B                 | 0.87%  | 7.91%  | 27.32% | 33.66% | 33.69% | 35.50% | 36.06% |
|                                       | Caa               | NA     | NA     | NA     | NA     | NA     | NA     | NA     |
|                                       | Investment Grade  | 0.08%  | 0.35%  | 1.03%  | 1.88%  | 2.72%  | 3.50%  | 4.08%  |
|                                       | Speculative Grade | 0.51%  | 5.10%  | 14.10% | 19.04% | 23.00% | 24.55% | 26.01% |
|                                       | All Ratings       | 0.11%  | 0.57%  | 1.60%  | 2.65%  | 3.65%  | 4.48%  | 5.11%  |
| <b>US ABS (excl. both MH and HEL)</b> |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
|                                       | Aaa               | 0.28%  | 0.40%  | 0.49%  | 0.55%  | 0.56%  | 0.57%  | 0.57%  |
|                                       | Aa                | 1.64%  | 3.25%  | 4.22%  | 4.79%  | 6.21%  | 8.07%  | 8.07%  |
|                                       | A                 | 0.04%  | 0.20%  | 0.74%  | 1.23%  | 1.65%  | 2.04%  | 2.10%  |
|                                       | Baa               | 0.04%  | 0.68%  | 3.00%  | 3.96%  | 4.52%  | 5.61%  | 6.76%  |
|                                       | Ba                | 0.49%  | 4.71%  | 8.86%  | 12.32% | 15.47% | 16.58% | 19.75% |
|                                       | B                 | 0.00%  | 6.55%  | 28.62% | 28.62% | 28.62% | 28.62% | 28.62% |
|                                       | Caa               | NA     | NA     | NA     | NA     | NA     | NA     | NA     |
|                                       | Investment Grade  | 0.27%  | 0.59%  | 1.19%  | 1.53%  | 1.82%  | 2.17%  | 2.31%  |
|                                       | Speculative Grade | 0.81%  | 5.29%  | 11.84% | 14.78% | 17.27% | 17.95% | 20.41% |
|                                       | All Ratings       | 0.30%  | 0.79%  | 1.59%  | 2.03%  | 2.38%  | 2.74%  | 2.96%  |
| <b>US CMBS</b>                        |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
|                                       | Aaa               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
|                                       | Aa                | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
|                                       | A                 | 0.00%  | 0.00%  | 0.06%  | 0.06%  | 0.06%  | 0.06%  | 0.06%  |
|                                       | Baa               | 0.00%  | 0.10%  | 0.23%  | 0.28%  | 0.28%  | 0.28%  | 0.28%  |
|                                       | Ba                | 0.00%  | 0.00%  | 0.20%  | 0.39%  | 0.39%  | 0.39%  | 0.39%  |
|                                       | B                 | 0.11%  | 0.33%  | 1.29%  | 2.98%  | 5.85%  | 6.87%  | 9.91%  |
|                                       | Caa               | NA     | NA     | NA     | NA     | NA     | NA     | NA     |
|                                       | Investment Grade  | 0.00%  | 0.03%  | 0.10%  | 0.12%  | 0.12%  | 0.12%  | 0.12%  |
|                                       | Speculative Grade | 0.05%  | 0.14%  | 0.75%  | 1.56%  | 3.18%  | 3.89%  | 4.40%  |
|                                       | All Ratings       | 0.01%  | 0.06%  | 0.28%  | 0.50%  | 0.85%  | 0.99%  | 1.10%  |

Figure 51

**Multi-Year Cumulative Loss Rates by Original Rating, 1993-2006**

| <b>US HEL &amp; RMBS</b>                 |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
|--|-------------------|--------|--------|--------|--------|--------|--------|--------|
|  | Aaa               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.02%  | 0.02%  | 0.02%  |
|  | Aa                | 0.00%  | 0.00%  | 0.00%  | 0.09%  | 0.10%  | 0.10%  | 0.10%  |
|  | A                 | 0.00%  | 0.00%  | 0.14%  | 0.28%  | 0.36%  | 0.43%  | 0.53%  |
|  | Baa               | 0.01%  | 0.14%  | 0.57%  | 1.74%  | 2.58%  | 2.93%  | 2.98%  |
|  | Ba                | 0.00%  | 0.36%  | 1.20%  | 2.67%  | 3.99%  | 4.42%  | 4.53%  |
|  | B                 | 0.16%  | 1.18%  | 5.68%  | 8.60%  | 9.25%  | 9.94%  | 9.94%  |
|  | Caa               | NA     | NA     | NA     | NA     | NA     | NA     | NA     |
|  | Investment Grade  | 0.00%  | 0.04%  | 0.17%  | 0.50%  | 0.73%  | 0.82%  | 0.85%  |
|  | Speculative Grade | 0.04%  | 0.62%  | 2.78%  | 4.71%  | 5.79%  | 6.30%  | 6.42%  |
|  | All Ratings       | 0.01%  | 0.09%  | 0.43%  | 0.94%  | 1.27%  | 1.42%  | 1.47%  |
| <b>US HEL (post-1998 vintages only)</b>  |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
|  | Aaa               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
|  | Aa                | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
|  | A                 | 0.00%  | 0.00%  | 0.05%  | 0.05%  | 0.15%  | 0.40%  | 0.40%  |
|  | Baa               | 0.00%  | 0.03%  | 0.25%  | 1.00%  | 2.69%  | 3.39%  | 3.39%  |
|  | Ba                | 0.00%  | 0.46%  | 2.68%  | 4.40%  | 5.47%  | 5.47%  | 5.47%  |
|  | B                 | 0.00%  | 0.00%  | 0.00%  | 14.99% | 14.99% | 17.37% | 17.37% |
|  | Caa               | NA     | NA     | NA     | NA     | NA     | NA     | NA     |
|  | Investment Grade  | 0.00%  | 0.01%  | 0.09%  | 0.29%  | 0.69%  | 0.94%  | 0.94%  |
|  | Speculative Grade | 0.00%  | 0.46%  | 3.36%  | 7.14%  | 7.95%  | 8.89%  | 8.89%  |
|  | All Ratings       | 0.00%  | 0.03%  | 0.20%  | 0.56%  | 1.04%  | 1.36%  | 1.36%  |
| <b>US RMBS (post-1998 vintages only)</b> |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
|  | Aaa               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
|  | Aa                | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
|  | A                 | 0.00%  | 0.00%  | 0.26%  | 0.43%  | 0.43%  | 0.43%  | 0.43%  |
|  | Baa               | 0.02%  | 0.02%  | 0.02%  | 0.72%  | 0.72%  | 0.72%  | 0.72%  |
|  | Ba                | 0.00%  | 0.00%  | 0.16%  | 1.70%  | 1.70%  | 1.70%  | 1.70%  |
|  | B                 | 0.00%  | 0.23%  | 1.46%  | 1.46%  | 1.46%  | 1.46%  | 1.46%  |
|  | Caa               | NA     | NA     | NA     | NA     | NA     | NA     | NA     |
|  | Investment Grade  | 0.00%  | 0.02%  | 0.08%  | 0.21%  | 0.21%  | 0.21%  | 0.21%  |
|  | Speculative Grade | 0.00%  | 0.09%  | 0.66%  | 1.73%  | 1.73%  | 1.73%  | 1.73%  |
|  | All Ratings       | 0.01%  | 0.03%  | 0.16%  | 0.42%  | 0.42%  | 0.42%  | 0.42%  |
| <b>Global CDOs</b>                       |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
|  | Aaa               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
|  | Aa                | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.53%  | 0.53%  | 0.98%  |
|  | A                 | 0.00%  | 0.22%  | 0.57%  | 0.91%  | 2.72%  | 2.72%  | 2.72%  |
|  | Baa               | 0.06%  | 0.88%  | 4.22%  | 7.45%  | 9.22%  | 10.79% | 10.92% |
|  | Ba                | 0.18%  | 2.38%  | 6.03%  | 8.71%  | 10.49% | 10.49% | 10.49% |
|  | B                 | 0.00%  | 5.77%  | 21.53% | 30.02% | 32.82% | 33.64% | 33.64% |
|  | Caa               | NA     | NA     | NA     | NA     | NA     | NA     | NA     |
|  | Investment Grade  | 0.02%  | 0.27%  | 1.22%  | 2.23%  | 3.09%  | 3.68%  | 3.86%  |
|  | Speculative Grade | 0.26%  | 2.98%  | 8.50%  | 12.21% | 14.31% | 14.72% | 14.72% |

Figure 51

**Multi-Year Cumulative Loss Rates by Original Rating, 1993-2006**

|                                 |                   |        |        |        |        |        |        |        |
|---------------------------------|-------------------|--------|--------|--------|--------|--------|--------|--------|
|                                 | All Ratings       | 0.04%  | 0.58%  | 2.10%  | 3.56%  | 4.63%  | 5.27%  | 5.42%  |
| <b>Global CDOs excl. HYCBOs</b> |                   | 1-Year | 2-Year | 3-Year | 4-Year | 5-Year | 6-Year | 7-Year |
|                                 | Aaa               | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
|                                 | Aa                | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.53%  | 0.53%  | 0.53%  |
|                                 | A                 | 0.00%  | 0.19%  | 0.44%  | 0.82%  | 1.93%  | 1.93%  | 1.93%  |
|                                 | Baa               | 0.07%  | 0.73%  | 2.50%  | 4.98%  | 5.91%  | 5.91%  | 5.91%  |
|                                 | Ba                | 0.22%  | 0.87%  | 2.35%  | 4.25%  | 5.34%  | 5.34%  | 5.34%  |
|                                 | B                 | 0.00%  | 1.56%  | 6.03%  | 7.91%  | 7.91%  | 9.73%  | 9.73%  |
|                                 | Caa               | NA     | NA     | NA     | NA     | NA     | NA     | NA     |
|                                 | Investment Grade  | 0.02%  | 0.22%  | 0.70%  | 1.46%  | 1.96%  | 1.96%  | 1.96%  |
|                                 | Speculative Grade | 0.32%  | 1.08%  | 2.93%  | 4.92%  | 5.89%  | 6.43%  | 6.43%  |
|                                 | All Ratings       | 0.05%  | 0.33%  | 0.95%  | 1.88%  | 2.45%  | 2.77%  | 2.77%  |

## Appendix 6: One-Year Rating Transition Matrices with a Principal Impairment Column

Figure 52

### Weighted-Average One-Year Rating Transition Matrix with a Principal Impairment\* Column by Cohort Rating (1993-2006)

| All Structured Finance | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa    | Principal Impairment | WR     |
|------------------------|--------|--------|--------|--------|--------|--------|--------|----------------------|--------|
| Aaa                    | 87.89% | 0.59%  | 0.20%  | 0.07%  | 0.03%  | 0.02%  | 0.02%  | 0.02%                | 11.17% |
| Aa                     | 5.49%  | 84.85% | 1.51%  | 0.57%  | 0.16%  | 0.09%  | 0.03%  | 0.13%                | 7.17%  |
| A                      | 1.17%  | 3.42%  | 85.23% | 1.61%  | 0.50%  | 0.18%  | 0.10%  | 0.20%                | 7.58%  |
| Baa                    | 0.31%  | 0.55%  | 2.91%  | 85.68% | 2.17%  | 0.84%  | 0.33%  | 0.87%                | 6.36%  |
| Ba                     | 0.06%  | 0.10%  | 0.53%  | 3.08%  | 83.58% | 2.84%  | 1.41%  | 2.76%                | 5.64%  |
| B                      | 0.06%  | 0.04%  | 0.11%  | 0.41%  | 2.28%  | 83.03% | 4.30%  | 4.96%                | 4.80%  |
| Caa                    | 0.06%  | 0.00%  | 0.00%  | 0.15%  | 0.32%  | 1.25%  | 71.25% | 19.07%               | 7.90%  |
| US ABS                 | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa    | Principal Impairment | WR     |
| Aaa                    | 86.19% | 0.64%  | 0.33%  | 0.13%  | 0.08%  | 0.04%  | 0.04%  | 0.06%                | 12.48% |
| Aa                     | 2.05%  | 88.24% | 1.99%  | 0.87%  | 0.27%  | 0.17%  | 0.09%  | 0.36%                | 5.96%  |
| A                      | 0.55%  | 1.59%  | 86.64% | 1.78%  | 0.66%  | 0.26%  | 0.17%  | 0.30%                | 8.05%  |
| Baa                    | 0.20%  | 0.22%  | 1.06%  | 87.78% | 2.69%  | 1.17%  | 0.44%  | 1.35%                | 5.09%  |
| Ba                     | 0.06%  | 0.12%  | 0.18%  | 1.91%  | 77.10% | 4.59%  | 3.13%  | 7.95%                | 4.97%  |
| B                      | 0.00%  | 0.00%  | 0.15%  | 0.43%  | 0.26%  | 69.60% | 7.92%  | 18.64%               | 2.99%  |
| Caa                    | 0.00%  | 0.00%  | 0.00%  | 0.11%  | 0.14%  | 0.73%  | 62.33% | 29.92%               | 6.78%  |
| US ABS ex. MH and HEL  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa    | Principal Impairment | WR     |
| Aaa                    | 84.99% | 0.47%  | 0.15%  | 0.08%  | 0.02%  | 0.03%  | 0.06%  | 0.11%                | 14.09% |
| Aa                     | 2.69%  | 79.53% | 3.44%  | 1.66%  | 0.58%  | 0.17%  | 0.12%  | 0.97%                | 10.84% |
| A                      | 0.79%  | 1.62%  | 83.00% | 1.95%  | 0.56%  | 0.16%  | 0.15%  | 0.16%                | 11.60% |
| Baa                    | 0.75%  | 0.45%  | 2.39%  | 80.14% | 3.06%  | 1.17%  | 0.84%  | 0.99%                | 10.23% |
| Ba                     | 0.18%  | 0.00%  | 0.20%  | 2.39%  | 71.44% | 6.91%  | 5.04%  | 4.09%                | 9.74%  |
| B                      | 0.00%  | 0.00%  | 0.00%  | 0.38%  | 0.00%  | 68.43% | 12.26% | 15.03%               | 3.91%  |
| Caa                    | 0.00%  | 0.00%  | 0.00%  | 0.20%  | 0.00%  | 1.34%  | 64.62% | 25.51%               | 8.34%  |
| US CMBS                | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa    | Principal Impairment | WR     |
| Aaa                    | 87.49% | 0.55%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%                | 11.95% |
| Aa                     | 14.76% | 77.04% | 0.44%  | 0.00%  | 0.00%  | 0.02%  | 0.00%  | 0.00%                | 7.73%  |
| A                      | 3.41%  | 8.98%  | 80.96% | 0.98%  | 0.07%  | 0.00%  | 0.00%  | 0.01%                | 5.60%  |
| Baa                    | 0.62%  | 1.31%  | 5.85%  | 82.05% | 1.92%  | 0.26%  | 0.01%  | 0.09%                | 7.91%  |
| Ba                     | 0.09%  | 0.04%  | 0.44%  | 2.74%  | 90.00% | 2.47%  | 0.19%  | 0.15%                | 3.88%  |
| B                      | 0.11%  | 0.03%  | 0.03%  | 0.19%  | 0.94%  | 90.25% | 4.47%  | 1.50%                | 2.48%  |
| Caa                    | 0.23%  | 0.00%  | 0.00%  | 0.00%  | 0.16%  | 0.62%  | 80.86% | 13.48%               | 4.65%  |
| US RMBS/HEL            | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa    | Principal Impairment | WR     |
| Aaa                    | 89.17% | 0.11%  | 0.05%  | 0.01%  | 0.00%  | 0.00%  | 0.00%  | 0.00%                | 10.65% |
| Aa                     | 5.60%  | 87.31% | 0.52%  | 0.13%  | 0.02%  | 0.01%  | 0.00%  | 0.01%                | 6.40%  |
| A                      | 0.90%  | 3.55%  | 88.76% | 0.91%  | 0.19%  | 0.05%  | 0.03%  | 0.12%                | 5.50%  |
| Baa                    | 0.17%  | 0.40%  | 2.52%  | 88.98% | 1.23%  | 0.58%  | 0.13%  | 0.61%                | 5.38%  |
| Ba                     | 0.05%  | 0.15%  | 0.87%  | 4.24%  | 85.42% | 1.07%  | 0.70%  | 2.10%                | 5.40%  |
| B                      | 0.00%  | 0.02%  | 0.17%  | 0.62%  | 4.28%  | 83.68% | 0.74%  | 4.91%                | 5.58%  |
| Caa                    | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 1.24%  | 0.00%  | 60.06% | 30.91%               | 7.78%  |

Figure 52

**Weighted-Average One-Year Rating Transition Matrix with a Principal Impairment\* Column by Cohort Rating (1993-2006)**

| US RMBS (post-1998) | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa    | Principal Impairment | WR     |
|---------------------|--------|--------|--------|--------|--------|--------|--------|----------------------|--------|
| Aaa                 | 90.72% | 0.01%  | 0.02%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%                | 9.26%  |
| Aa                  | 9.89%  | 84.30% | 0.09%  | 0.06%  | 0.01%  | 0.01%  | 0.00%  | 0.00%                | 5.64%  |
| A                   | 1.31%  | 8.33%  | 83.84% | 0.49%  | 0.06%  | 0.04%  | 0.00%  | 0.17%                | 5.76%  |
| Baa                 | 0.19%  | 0.78%  | 7.79%  | 84.55% | 0.44%  | 0.30%  | 0.02%  | 0.10%                | 5.83%  |
| Ba                  | 0.08%  | 0.21%  | 1.20%  | 8.64%  | 84.32% | 0.41%  | 0.07%  | 0.46%                | 4.59%  |
| B                   | 0.00%  | 0.06%  | 0.28%  | 0.42%  | 10.07% | 83.07% | 0.36%  | 1.08%                | 4.66%  |
| Caa                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 100.00%              | 0.00%  |
| US HEL (post-1998)  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa    | Principal Impairment | WR     |
| Aaa                 | 88.39% | 0.09%  | 0.03%  | 0.00%  | 0.02%  | 0.00%  | 0.00%  | 0.00%                | 11.47% |
| Aa                  | 2.15%  | 92.52% | 0.54%  | 0.05%  | 0.02%  | 0.03%  | 0.00%  | 0.00%                | 4.69%  |
| A                   | 0.16%  | 1.71%  | 93.80% | 0.98%  | 0.21%  | 0.09%  | 0.03%  | 0.00%                | 3.02%  |
| Baa                 | 0.00%  | 0.08%  | 0.59%  | 93.15% | 1.26%  | 0.72%  | 0.16%  | 0.31%                | 3.73%  |
| Ba                  | 0.00%  | 0.06%  | 0.00%  | 0.85%  | 90.58% | 2.35%  | 1.06%  | 1.67%                | 3.42%  |
| B                   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 1.05%  | 76.27% | 4.71%  | 15.71%               | 2.27%  |
| Caa                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 36.84% | 41.35%               | 21.80% |
| Global CDOs         | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa    | Principal Impairment | WR     |
| Aaa                 | 89.07% | 2.48%  | 0.57%  | 0.18%  | 0.03%  | 0.01%  | 0.00%  | 0.00%                | 7.66%  |
| Aa                  | 2.14%  | 84.09% | 4.50%  | 1.67%  | 0.39%  | 0.17%  | 0.03%  | 0.02%                | 6.99%  |
| A                   | 0.73%  | 1.85%  | 83.64% | 4.03%  | 1.32%  | 0.39%  | 0.16%  | 0.27%                | 7.60%  |
| Baa                 | 0.15%  | 0.42%  | 1.52%  | 83.18% | 4.00%  | 1.80%  | 0.80%  | 1.72%                | 6.42%  |
| Ba                  | 0.04%  | 0.07%  | 0.28%  | 1.47%  | 80.60% | 4.55%  | 2.82%  | 3.12%                | 7.05%  |
| B                   | 0.06%  | 0.12%  | 0.31%  | 0.47%  | 2.87%  | 71.28% | 8.34%  | 9.51%                | 7.02%  |
| Caa                 | 0.00%  | 0.00%  | 0.00%  | 0.35%  | 0.32%  | 1.29%  | 73.26% | 15.84%               | 8.95%  |
| Europe SF ex. CDOs  | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa    | Principal Impairment | WR     |
| Aaa                 | 91.90% | 0.10%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%                | 8.00%  |
| Aa                  | 2.00%  | 89.29% | 0.39%  | 0.02%  | 0.00%  | 0.00%  | 0.00%  | 0.00%                | 8.29%  |
| A                   | 0.39%  | 3.52%  | 89.18% | 0.56%  | 0.12%  | 0.00%  | 0.00%  | 0.00%                | 6.23%  |
| Baa                 | 0.13%  | 0.06%  | 3.35%  | 89.01% | 0.67%  | 0.07%  | 0.03%  | 0.06%                | 6.62%  |
| Ba                  | 0.00%  | 0.00%  | 0.28%  | 3.77%  | 87.43% | 1.67%  | 0.36%  | 0.10%                | 6.40%  |
| B                   | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 2.96%  | 74.81% | 8.89%  | 1.73%                | 11.60% |
| Caa                 | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 87.07% | 3.80%                | 9.13%  |

\*Principal impairment includes securities that had sustained principal write-down or principal losses, or had been downgraded to Ca or C as of the end of the study period. In this matrix, WR stands for withdrawn ratings that were not principal-impaired.

## Appendix 7: Moody's Idealized Loss Rate Table

| Rating | Horizon  |          |          |          |          |          |          |          |          |          |
|--------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
|        | 1-Year   | 2-Year   | 3-Year   | 4-Year   | 5-Year   | 6-Year   | 7-Year   | 8-Year   | 9-Year   | 10-Year  |
| Aaa    | 0.0000%  | 0.0001%  | 0.0004%  | 0.0010%  | 0.0016%  | 0.0022%  | 0.0029%  | 0.0036%  | 0.0045%  | 0.0055%  |
| Aa1    | 0.0003%  | 0.0017%  | 0.0055%  | 0.0116%  | 0.0171%  | 0.0231%  | 0.0297%  | 0.0369%  | 0.0451%  | 0.0550%  |
| Aa2    | 0.0007%  | 0.0044%  | 0.0143%  | 0.0259%  | 0.0374%  | 0.0490%  | 0.0611%  | 0.0743%  | 0.0902%  | 0.1100%  |
| Aa3    | 0.0017%  | 0.0105%  | 0.0325%  | 0.0556%  | 0.0781%  | 0.1007%  | 0.1249%  | 0.1496%  | 0.1799%  | 0.2200%  |
| A1     | 0.0032%  | 0.0204%  | 0.0644%  | 0.1040%  | 0.1436%  | 0.1815%  | 0.2233%  | 0.2640%  | 0.3152%  | 0.3850%  |
| A2     | 0.0060%  | 0.0385%  | 0.1221%  | 0.1898%  | 0.2569%  | 0.3207%  | 0.3905%  | 0.4560%  | 0.5401%  | 0.6600%  |
| A3     | 0.0214%  | 0.0825%  | 0.1980%  | 0.2970%  | 0.4015%  | 0.5005%  | 0.6105%  | 0.7150%  | 0.8360%  | 0.9900%  |
| Baa1   | 0.0495%  | 0.1540%  | 0.3080%  | 0.4565%  | 0.6050%  | 0.7535%  | 0.9185%  | 1.0835%  | 1.2485%  | 1.4300%  |
| Baa2   | 0.0935%  | 0.2585%  | 0.4565%  | 0.6600%  | 0.8690%  | 1.0835%  | 1.3255%  | 1.5675%  | 1.7820%  | 1.9800%  |
| Baa3   | 0.2310%  | 0.5775%  | 0.9405%  | 1.3090%  | 1.6775%  | 2.0350%  | 2.3815%  | 2.7335%  | 3.0635%  | 3.3550%  |
| Ba1    | 0.4785%  | 1.1110%  | 1.7215%  | 2.3100%  | 2.9040%  | 3.4375%  | 3.8830%  | 4.3395%  | 4.7795%  | 5.1700%  |
| Ba2    | 0.8580%  | 1.9085%  | 2.8490%  | 3.7400%  | 4.6255%  | 5.3735%  | 5.8850%  | 6.4130%  | 6.9575%  | 7.4250%  |
| Ba3    | 1.5455%  | 3.0305%  | 4.3285%  | 5.3845%  | 6.5230%  | 7.4195%  | 8.0410%  | 8.6405%  | 9.1905%  | 9.7130%  |
| B1     | 2.5740%  | 4.6090%  | 6.3690%  | 7.6175%  | 8.8660%  | 9.8395%  | 10.5215% | 11.1265% | 11.6820% | 12.2100% |
| B2     | 3.9380%  | 6.4185%  | 8.5525%  | 9.9715%  | 11.3905% | 12.4575% | 13.2055% | 13.8325% | 14.4210% | 14.9600% |
| B3     | 6.3910%  | 9.1355%  | 11.5665% | 13.2220% | 14.8775% | 16.0600% | 17.0500% | 17.9190% | 18.5790% | 19.1950% |
| Caa1   | 9.5599%  | 12.7788% | 15.7512% | 17.8634% | 19.9726% | 21.4317% | 22.7620% | 24.0113% | 25.1195% | 26.2350% |
| Caa2   | 14.3000% | 17.8750% | 21.4500% | 24.1340% | 26.8125% | 28.6000% | 30.3875% | 32.1750% | 33.9625% | 35.7500% |
| Caa3   | 28.0446% | 31.3548% | 34.3475% | 36.4331% | 38.4017% | 39.6611% | 40.8817% | 42.0669% | 43.2196% | 44.3850% |

## Appendix 8: List of 2006 Newly Impaired Tranches

| Sector | Asset Type           | Deal Name   | Tranche Name | Deal Closing Date | Original Balance | Original Rating | Payment Shortfall Year | Payment Shortfall Month | Ca/C Rating Year | Ca/C Rating Month | Impairment Year | Impairment Month | Principal Impaired (PM) or Interest Impaired (IM)? |
|--------|----------------------|---|--------------|-------------------|------------------|-----------------|------------------------|-------------------------|------------------|-------------------|-----------------|------------------|--|
| ABS    | Franchise Loans      | Falcon Auto Dealership LLC, Series 2001-1             | Class F      | 12/5/2001         | 5,617,000        | B2              | 2006                   | 11                      |                  |                   | 2006            | 11               | IM   |
| ABS    | Franchise Loans      | MSDWMC Owner Trust 2000-F1                            | Class E      | 9/15/2000         | 9,365,000        | Baa2            | 2006                   | 11                      |                  |                   | 2006            | 11               | IM   |
| ABS    | Franchise Loans      | MSDWMC Owner Trust 2000-F1                            | Class F      | 9/15/2000         | 1,756,000        | Baa3            | 2006                   | 8                       |                  |                   | 2006            | 8                | IM   |
| ABS    | Leases - Equipment   | DVI Receivables X, L.L.C.                             | Class A-4    | 10/29/1999        | 99,051,000       | Aaa             | 2006                   | 12                      |                  |                   | 2006            | 12               | IM   |
| ABS    | Leases - Equipment   | Frontier Equipment Receivables Trust 2004-1           | Cl. B        | 7/30/2004         | 4,397,824        | Ba2             | 2006                   | 11                      |                  |                   | 2006            | 11               | PM   |
| ABS    | Leases - Equipment   | Frontier Equipment Receivables Trust 2004-1           | Cl. C        | 7/30/2004         | 1,465,941        | B1              | 2006                   | 11                      |                  |                   | 2006            | 11               | PM   |
| ABS    | Manufactured Housing | Conseco Finance Securitization Corp. Series 2002-2    | Class B-1    | 6/14/2002         | 28,750,000       | Baa2            |                        |                         | 2006             | 8                 | 2006            | 8                | PM   |
| ABS    | Manufactured Housing | Conseco Finance Securitizations Corp. Series 2000-6   | Cl. M-1      | 12/28/2000        | 27,000,000       | Aa2             | 2006                   | 5                       | 2006             | 8                 | 2006            | 5                | PM   |
| ABS    | Manufactured Housing | Conseco Finance Securitizations Corp. Series 2001-1   | Cl. M-1      | 3/29/2001         | 36,000,000       | Aa2             | 2006                   | 2                       | 2006             | 8                 | 2006            | 2                | PM   |
| ABS    | Manufactured Housing | Conseco Finance Securitizations Corp. Series 2001-2   | Cl. M-1      | 6/27/2001         | 31,250,000       | Aa2             | 2006                   | 4                       | 2006             | 8                 | 2006            | 4                | PM   |
| ABS    | Manufactured Housing | Conseco Finance Securitizations Corp. Series 2001-3   | Class M-1    | 9/6/2001          | 37,500,000       | Aa2             |                        |                         | 2006             | 8                 | 2006            | 8                | PM   |
| ABS    | Manufactured Housing | Conseco Finance Securitizations Corp. Series 2002-1   | Class B-1    | 4/11/2002         | 15,000,000       | Baa2            |                        |                         | 2006             | 8                 | 2006            | 8                | PM   |
| ABS    | Manufactured Housing | Green Tree Financial Corporation MH 1998-02           | M-1          | 3/18/1998         | 52,500,000       | Aa3             |                        |                         | 2006             | 8                 | 2006            | 8                | PM   |
| ABS    | Manufactured Housing | Green Tree Financial Corporation MH 1998-04           | M-1          | 5/28/1998         | 35,000,000       | Aa3             |                        |                         | 2006             | 8                 | 2006            | 8                | PM   |
| ABS    | Manufactured Housing | Green Tree Financial Corporation MH 1998-05           | M-1          | 6/25/1998         | 24,950,000       | Aa3             |                        |                         | 2006             | 8                 | 2006            | 8                | PM   |
| ABS    | Manufactured Housing | Green Tree Financial Corporation MH 1998-07           | M-2          | 9/30/1998         | 25,500,000       | A2              |                        |                         | 2006             | 8                 | 2006            | 8                | PM   |
| ABS    | Manufactured Housing | Lehman ABS Manufactured Housing Contract Trust 2001-B | Cl. B-1      | 11/2/2001         | 77,862,302       | Baa2            |                        |                         | 2006             | 6                 | 2006            | 6                | PM   |
| ABS    | Mutual Fund Fees     | FEP Receivables Funding II, L.P.                      | Class A-3    | 9/30/1999         | 40,000,000       | Baa2            | 2006                   | 11                      | 2006             | 5                 | 2006            | 5                | PM   |



| Sector | Asset Type       | Deal Name  | Tranche Name | Deal Closing Date | Original Balance | Original Rating | Payment Shortfall Year | Payment Shortfall Month | Ca/C Rating Year | Ca/C Rating Month | Impairment Year | Impairment Month | Principal Impaired (PM) or Interest Impaired (IM)? |
|--------|------------------|--|--------------|-------------------|------------------|-----------------|------------------------|-------------------------|------------------|-------------------|-----------------|------------------|--|
| ABS    | Mutual Fund Fees | FEP Receivables Funding III, L.P.  | Class A-2    | 2/7/2000          | 91,900,000       | A2              |                        |                         | 2006             | 5                 | 2006            | 5                | PM   |
| ABS    | Mutual Fund Fees | FEP Receivables Funding III, L.P.  | Class A-3    | 2/7/2000          | 37,500,000       | Baa3            | 2006                   | 7                       | 2006             | 5                 | 2006            | 5                | PM   |
| ABS    | Mutual Fund Fees | FEP Receivables Funding III, L.P.  | Class B-1L   | 2/7/2000          | 20,000,000       | Ba2             | 2006                   | 4                       | 2006             | 5                 | 2006            | 4                | PM   |
| ABS    | Mutual Fund Fees | FEP Receivables Funding, L.P.  | Class A-3    | 5/10/1999         | 28,000,000       | Baa3            | 2006                   | 7                       | 2006             | 5                 | 2006            | 5                | PM   |
| ABS    | Mutual Fund Fees | FEP Receivables Funding, L.P.  | Class B      | 5/10/1999         | 22,500,000       | Ba2             | 2006                   | 1                       | 2006             | 5                 | 2006            | 1                | PM   |
| ABS    | Mutual Fund Fees | FEP Receivables Trust 2000-2   | Class A-2    | 4/7/2000          | 49,250,000       | A2              |                        |                         | 2006             | 5                 | 2006            | 5                | PM   |
| ABS    | Mutual Fund Fees | FEP Receivables Trust 2000-2   | Class A-3    | 4/7/2000          | 41,000,000       | Baa3            | 2006                   | 7                       | 2006             | 5                 | 2006            | 5                | PM   |
| ABS    | Mutual Fund Fees | FEP Receivables Trust 2000-2   | Class B-1    | 4/7/2000          | 10,000,000       | Ba2             | 2006                   | 7                       | 2006             | 5                 | 2006            | 5                | PM   |
| ABS    | Mutual Fund Fees | FEP Receivables Trust 2000-3   | Class A-2    | 8/11/2000         | 23,000,000       | A2              |                        |                         | 2006             | 5                 | 2006            | 5                | PM   |
| ABS    | Mutual Fund Fees | FEP Receivables Trust 2000-3   | Class A-3    | 8/11/2000         | 23,500,000       | Baa3            | 2006                   | 7                       | 2006             | 5                 | 2006            | 5                | PM   |
| ABS    | Mutual Fund Fees | FEP Receivables Trust 2001-1   | Class BL     | 1/23/2001         | 5,000,000        | Ba1             |                        |                         | 2006             | 5                 | 2006            | 5                | PM   |
| ABS    | Mutual Fund Fees | Floating Rate Mutual Fund Fee Trust 2000-R4  | Certificates | 11/9/2000         | 19,500,000       | Aa3             |                        |                         | 2006             | 5                 | 2006            | 5                | PM   |
| ABS    | Mutual Fund Fees | Mutual Fund Fee Trust XIV, Series 2000-4   | Class 2      | 11/9/2000         | 122,600,000      | A2              |                        |                         | 2006             | 5                 | 2006            | 5                | PM   |
| ABS    | HEL              | Aames Mortgage Trust 2001-3  | Cl. B        | 9/25/2001         | 7,000,000        | Baa2            | 2006                   | 7                       |                  |                   | 2006            | 7                | PM   |
| ABS    | HEL              | ABFC Mortgage Loan Asset-Backed Certificates, Series 2001-AQ1                                    | Cl. B        | 3/29/2001         | 5,838,000        | Baa2            | 2006                   | 4                       |                  |                   | 2006            | 4                | PM   |
| ABS    | HEL              | Ace Securities Corp. Home Equity Loan Trust, Series 2002-HE1                                     | Cl. M-4      | 7/16/2002         | 6,757,000        | Baa3            | 2006                   | 12                      | 2006             | 10                | 2006            | 10               | PM   |
| ABS    | HEL              | ACE Securities Corp. Home Equity Loan Trust, Series 2004-HE1                                     | Cl. B        | 3/30/2004         | 8,892,000        | Ba2             | 2006                   | 3                       |                  |                   | 2006            | 3                | PM   |
| ABS    | HEL              | AMRESCO Residential Mortgage Loan Trust 1997-3   | B-1F         | 9/17/1997         | 10,640,000       | Baa3            | 2006                   | 3                       |                  |                   | 2006            | 3                | PM   |
| ABS    | HEL              | Asset Backed Securities Corporation, Long Beach Home Equity Loan Trust 2000-LB1, Home ...s 2000- | Cl. BV       | 8/31/2000         | 56,250,000       | Baa3            | 2006                   | 1                       |                  |                   | 2006            | 1                | PM   |
| ABS    | HEL              | CDC Mortgage Capital Trust 2002-HE2  | Cl. B-2      | 7/31/2002         | 6,481,000        | Baa3            |                        |                         | 2006             | 11                | 2006            | 11               | PM   |

| Sector | Asset Type | Deal Name   | Tranche Name                    | Deal Closing Date | Original Balance | Original Rating | Payment Shortfall Year | Payment Shortfall Month | Ca/C Rating Year | Ca/C Rating Month | Impairment Year | Impairment Month | Principal Impaired (PM) or Interest Impaired (IM)? |
|--------|------------|---|---------------------------------|-------------------|------------------|-----------------|------------------------|-------------------------|------------------|-------------------|-----------------|------------------|--|
| ABS    | HEL        | CDC Mortgage Capital Trust 2002-HE3                                 | Cl. B-2                         | 11/27/2002        | 10,229,000       | Baa3            | 2006                   | 11                      | 2006             | 11                | 2006            | 11               | PM   |
| ABS    | HEL        | CS First Boston Mortgage Securities Corp 2001-HE25                  | Cl. B                           | 11/27/2001        | 23,500,000       | Baa3            | 2006                   | 11                      | 2006             | 10                | 2006            | 10               | PM   |
| ABS    | HEL        | CSFB ABS Trust Mortgage Pass-Through Certificates, Series 2001-HE20 | Cl. B                           | 9/25/2001         | 12,200,000       | Baa2            | 2006                   | 11                      | 2006             | 10                | 2006            | 10               | PM   |
| ABS    | HEL        | CSFB Mortgage Pass-Through Certificates, Series 2001-HE17           | Cl. B                           | 8/23/2001         | 10,250,000       | Baa2            | 2006                   | 1                       | 2006             | 5                 | 2006            | 1                | PM   |
| ABS    | HEL        | GE Capital Mtg Services Inc 1997-HE3                                | B1                              | 9/26/1997         | 5,324,000        | A2              | 2006                   | 3                       |                  |                   | 2006            | 3                | PM   |
| ABS    | HEL        | GE Capital Mtg Services Inc 1997-HE4                                | B1                              | 12/30/1997        | 4,189,000        | A2              | 2006                   | 1                       |                  |                   | 2006            | 1                | PM   |
| ABS    | HEL        | GSAMP Trust 2004-SEA2   | Cl. B-1                         | 6/29/2004         | 11,794,000       | Baa3            | 2006                   | 12                      | 2006             | 11                | 2006            | 11               | PM   |
| ABS    | HEL        | GSAMP Trust 2004-SEA2   | Cl. B-2                         | 6/29/2004         | 6,207,000        | Ba1             | 2006                   | 6                       | 2006             | 8                 | 2006            | 6                | PM   |
| ABS    | HEL        | Long Beach Mortgage Loan Trust 2001-1                               | Cl. M-3                         | 3/15/2001         | 16,323,000       | Baa1            | 2006                   | 1                       |                  |                   | 2006            | 1                | PM   |
| ABS    | HEL        | Long Beach Mortgage Loan Trust 2002-2                               | Cl. M4B                         | 6/4/2002          | 10,005,000       | Baa3            | 2007                   | 1                       | 2006             | 8                 | 2006            | 8                | PM   |
| ABS    | HEL        | RAMP Series 2002-RS1 Trust  | Cl. M-I-3                       | 1/29/2002         | 6,480,000        | Baa2            | 2006                   | 4                       |                  |                   | 2006            | 4                | PM   |
| ABS    | HEL        | RAMP Series 2002-RS1 Trust  | Cl. M-II-3                      | 1/29/2002         | 3,425,000        | Baa2            | 2006                   | 5                       |                  |                   | 2006            | 5                | PM   |
| ABS    | HEL        | Residential Asset Securities Corporation, Series 2002-KS2           | Cl. M-I-3                       | 4/2/2002          | 13,750,000       | Baa2            | 2006                   | 12                      |                  |                   | 2006            | 12               | PM   |
| ABS    | HEL        | Structured Asset Securities Corp 2002-BC1                           | Cl. B                           | 11/27/2002        | 8,979,000        | Baa3            | 2007                   | 1                       | 2006             | 11                | 2006            | 11               | PM   |
| ABS    | HEL        | Green Tree Home Improvement Loans 1995-E                            | Certificate                     | 9/21/1995         | 32,241,212       | A3              | 2006                   | 10                      |                  |                   | 2006            | 10               | PM   |
| ABS    | HEL        | RAMP Series 2002-RS2 Trust  | Cl. M-II-3                      | 3/27/2002         | 2,725,000        | Baa2            | 2006                   | 3                       |                  |                   | 2006            | 3                | PM   |
| CDO    | BalSh CF   | Project Funding Corporation I                                       | \$21,607,000 Class IV Mezzanine | 3/5/1998          | 21,607,000       | Ba2             |                        |                         | 2006             | 11                | 2006            | 11               | PM   |
| CDO    | HY CBO     | Batterson Park CBO I, Ltd   | Class B                         | 11/17/1998        | 16,500,000       | Baa3            | 2006                   | 7                       |                  |                   | 2006            | 7                | IM   |
| CDO    | HY CBO     | BEA CBO 1998-1 LTD.   | Class A-2A 6.72% Notes          | 5/21/1998         | 182,150,000      | Baa3            |                        |                         | 2006             | 7                 | 2006            | 7                | PM   |
| CDO    | HY CBO     | Freedom 1999-1 CDO, Ltd (formerly Cigna CDO 1999-1)                 | \$24,000,000 Class IIB Senior S | 11/17/1999        | 24,000,000       | Aa2             |                        |                         | 2006             | 2                 | 2006            | 2                | PM   |
| CDO    | HY CBO     | ML CBO Series 1997-AIG-1  | Class A Floating Rate Senior S  | 6/11/1997         | 230,500,000      | Aa2             |                        |                         | 2006             | 6                 | 2006            | 6                | PM   |
| CDO    | HY CBO     | ML CBO Series 1998-E&P-1  | US \$50,000,000 Class A-3 Fixed | 4/8/1998          | 50,000,000       | Aa2             |                        |                         | 2006             | 3                 | 2006            | 3                | PM   |
| CDO    | HY CLO     | ML CLO Series 1998-Pilgrim America-2                                | US \$10,000,000 Class C Fixed R | 4/28/1998         | 10,000,000       | Ba3             | 2006                   | 12                      | 2006             | 8                 | 2006            | 8                | PM   |
| CDO    | HY CLO     | ML CLO XII Pilgrim America Ltd.                                     | US \$131,000,000 Class B Second | 11/13/1997        | 131,000,000      | Baa3            | 2006                   | 9                       | 2006             | 6                 | 2006            | 6                | PM   |

| Sector | Asset Type | Deal Name  | Tranche Name                   | Deal Closing Date | Original Balance | Original Rating | Payment Shortfall Year | Payment Shortfall Month | Ca/C Rating Year | Ca/C Rating Month | Impairment Year | Impairment Month | Principal Impaired (PM) or Interest Impaired (IM)? |
|--------|------------|--|--------------------------------|-------------------|------------------|-----------------|------------------------|-------------------------|------------------|-------------------|-----------------|------------------|--|
| CDO    | HY CLO     | Royalton Company( ML CBO X (Delaware) Corp)  | Class B Second Senior Secured  | 8/28/1997         | 62,000,000       | Baa3            | 2002                   | 6                       | 2006             | 7                 | 2006            | 7                | PM   |
| CDO    | SF CDO     | MKP CBO I, Ltd.  | Class A-2L Floating Rate Notes | 2/8/2000          | 25,000,000       | Aa3             |                        |                         | 2006             | 7                 | 2006            | 7                | PM   |
| CDO    | SF CDO     | SFA Collateralized Asset-Backed Securities I Trust   | Class B-2 8.575% Notes due 203 | 6/22/2000         | 8,500,000        | A2              |                        |                         | 2006             | 8                 | 2006            | 8                | PM   |
| CDO    | SF CDO     | Solstice II  | 16,000 Class 2 Preference shar | 5/9/2002          | 16,000,000       | Ba3             |                        |                         | 2006             | 8                 | 2006            | 8                | PM   |
| CMB    | CMBS       | Banc of America Commercial Mortgage Inc. Commercial Mortgage Pass-Through Certificates, Series 2 | Cl. K                          | 6/5/2001          | 23,480,584       | Ba2             | 2006                   | 8                       |                  |                   | 2006            | 8                | IM   |
| CMB    | CMBS       | Banc of America Commercial Mortgage Inc. Commercial Mortgage Pass-Through Certificates, Series 2 | Cl. L                          | 6/5/2001          | 2,134,598        | Ba3             | 2006                   | 8                       |                  |                   | 2006            | 8                | IM   |
| CMB    | CMBS       | Banc of America Commercial Mortgage Inc. Commercial Mortgage Pass-Through Certificates, Series 2 | Cl. M                          | 6/5/2001          | 5,538,842        | B1              | 2006                   | 8                       |                  |                   | 2006            | 8                | IM   |
| CMB    | CMBS       | Banc of America Commercial Mortgage Inc. Commercial Mortgage Pass-Through Certificates, Series 2 | Cl. N                          | 6/5/2001          | 6,788,329        | B2              | 2006                   | 8                       |                  |                   | 2006            | 8                | IM   |
| CMB    | CMBS       | Bear Stearns Commercial Mortgage Securities Inc 1998-C1  | I                              | 6/29/1998         | 17,868,478       | B2              | 2006                   | 2                       | 2006             | 5                 | 2006            | 2                | PM   |
| CMB    | CMBS       | Citigroup Commercial Mortgage Trust 2005-EMG   | Cl. M                          | 5/25/2005         | 1,805,489        | B1              | 2006                   | 6                       |                  |                   | 2006            | 6                | PM   |
| CMBS   | CMBS       | Commercial Mortgage Asset Trust 1999-C1  | L                              | 3/25/1999         | 17,813,000       | B3              | 2006                   | 9                       | 2006             | 7                 | 2006            | 7                | PM   |
| CMBS   | CMBS       | Commercial Mortgage Asset Trust 1999-C2  | N                              | 10/28/1999        | 5,813,000        | B3              | 2007                   | 2                       | 2006             | 5                 | 2006            | 5                | PM   |
| CMBS   | CMBS       | CS First Boston Mortgage Securities Corp 1998-C2   | I                              | 11/24/1998        | 19,200,000       | B3              | 2005                   | 11                      | 2006             | 1                 | 2006            | 1                | PM   |
| CMBS   | CMBS       | CS First Boston Mortgage Securities Corp 2001-CF2  | Cl. M                          | 4/27/2001         | 9,854,000        | B2              | 2006                   | 12                      | 2006             | 10                | 2006            | 10               | PM   |
| CMBS   | CMBS       | CS First Boston Mortgage Securities Corp 2001-CK3  | Cl. N                          | 6/13/2001         | 6,762,000        | B3              | 2006                   | 3                       | 2006             | 7                 | 2006            | 3                | PM   |
| CMBS   | CMBS       | CS First Boston Mortgage Securities Corp 2001-CKN5   | Cl. O                          | 11/16/2001        | 8,046,000        | B3              | 2006                   | 7                       | 2006             | 10                | 2006            | 7                | PM   |
| CMBS   | CMBS       | CS First Boston Mortgage Securities Corp 2001-FL2  | Cl. K                          | 9/4/2001          | 9,286,000        | Ba3             | 2006                   | 3                       |                  |                   | 2006            | 3                | IM   |
| CMBS   | CMBS       | CS First Boston Mortgage Securities Corp 2001-FL2  | Cl. L                          | 9/4/2001          | 7,738,000        | B1              | 2006                   | 3                       |                  |                   | 2006            | 3                | IM   |

| Sector | Asset Type | Deal Name  | Tranche Name | Deal Closing Date | Original Balance | Original Rating | Payment Shortfall Year | Payment Shortfall Month | Ca/C Rating Year | Ca/C Rating Month | Impairment Year | Impairment Month | Principal Impaired (PM) or Interest Impaired (IM)? |
|--------|------------|--|--------------|-------------------|------------------|-----------------|------------------------|-------------------------|------------------|-------------------|-----------------|------------------|--|
| CMBS   | CMBS       | CS First Boston Mortgage Securities Corp 2001-FL2                      | Cl. M        | 9/4/2001          | 9,286,000        | B2              | 2006                   | 3                       | 2006             | 1                 | 2006            | 1                | PM   |
| CMBS   | CMBS       | DLJ Commercial Mortgage Corp. 1999-CG3                                 | B-7          | 10/12/1999        | 8,993,000        | B2              | 2005                   | 12                      | 2006             | 1                 | 2006            | 1                | PM   |
| CMBS   | CMBS       | GMAC Commercial Mortgage Pass-Through Certificates, Series 2002-FL1    | Cl. F        | 3/19/2002         | 24,181,408       | Ba2             | 2006                   | 4                       |                  |                   | 2006            | 4                | PM   |
| CMBS   | CMBS       | GMAC Commercial Mortgage Securities, Inc. Series 2000-C3               | Cl. O        | 12/14/2000        | 3,186,000        | Caa2            | 2006                   | 10                      |                  |                   | 2006            | 10               | IM   |
| CMBS   | CMBS       | GMAC Commercial Mortgage Securities, Inc., Series 2003-FL1             | Cl. F        | 4/30/2003         | 20,104,000       | Ba2             | 2006                   | 7                       |                  |                   | 2006            | 7                | PM   |
| CMBS   | CMBS       | J.P. Morgan Chase Commercial Mortgage Securities Corp., Series 2002-C3 | Cl. J        | 12/23/2002        | 13,048,000       | Ba2             | 2006                   | 11                      |                  |                   | 2006            | 11               | IM   |
| CMBS   | CMBS       | J.P. Morgan Chase Commercial Mortgage Securities Corp., Series 2002-C3 | Cl. K        | 12/23/2002        | 2,797,000        | Ba3             | 2006                   | 9                       |                  |                   | 2006            | 9                | IM   |
| CMBS   | CMBS       | J.P. Morgan Chase Commercial Mortgage Securities Corp., Series 2002-C3 | Cl. L        | 12/23/2002        | 3,728,000        | B1              | 2006                   | 9                       |                  |                   | 2006            | 9                | IM   |
| CMBS   | CMBS       | J.P. Morgan Chase Commercial Mortgage Securities Corp., Series 2002-C3 | Cl. M        | 12/23/2002        | 7,456,000        | B2              | 2006                   | 6                       | 2006             | 9                 | 2006            | 6                | PM   |
| CMBS   | CMBS       | J.P. Morgan Chase Commercial Mortgage Securities Corp., Series 2002-C3 | Cl. N        | 12/23/2002        | 4,660,000        | B3              | 2006                   | 5                       | 2006             | 9                 | 2006            | 5                | PM   |
| CMBS   | CMBS       | J.P. Morgan Commercial Mortgage Finance Corp. 2000-C10                 | Cl. L        | 9/28/2000         | 7,386,000        | B2              | 2006                   | 5                       | 2006             | 12                | 2006            | 12               | PM   |
| CMBS   | CMBS       | LB Commercial Mortgage Trust 1999-C2                                   | M            | 10/13/1999        | 2,678,000        | B3              | 2006                   | 11                      |                  |                   | 2006            | 11               | IM   |
| CMBS   | CMBS       | LB Commercial Mortgage Trust 1999-C2                                   | N            | 10/13/1999        | 2,230,000        | Caa2            | 2006                   | 7                       |                  |                   | 2006            | 7                | IM   |
| CMBS   | CMBS       | LB-UBS Commercial Mortgage Trust 2000-C5                               | Cl. K        | 12/6/2000         | 4,980,000        | Ba3             | 2006                   | 6                       |                  |                   | 2006            | 6                | IM   |
| CMBS   | CMBS       | LB-UBS Commercial Mortgage Trust 2000-C5                               | Cl. L        | 12/6/2000         | 7,479,000        | B1              | 2006                   | 4                       |                  |                   | 2006            | 4                | IM   |
| CMBS   | CMBS       | LB-UBS Commercial Mortgage Trust 2001-C2                               | Cl. N        | 5/24/2001         | 6,712,000        | B3              | 2006                   | 4                       |                  |                   | 2006            | 4                | IM   |
| CMBS   | CMBS       | Mortgage Capital Funding Inc 1998-MC3                                  | J            | 12/29/1998        | 22,704,000       | B2              | 2006                   | 12                      | 2006             | 9                 | 2006            | 9                | PM   |
| CMBS   | CMBS       | Mortgage Capital Funding Inc 1998-MC3                                  | K            | 12/29/1998        | 9,082,000        | B3              | 2006                   | 4                       | 2006             | 9                 | 2006            | 4                | PM   |

| Sector | Asset Type  | Deal Name   | Tranche Name | Deal Closing Date | Original Balance | Original Rating | Payment Shortfall Year | Payment Shortfall Month | Ca/C Rating Year | Ca/C Rating Month | Impairment Year | Impairment Month | Principal Impaired (PM) or Interest Impaired (IM)? |
|--------|-------------|---|--------------|-------------------|------------------|-----------------|------------------------|-------------------------|------------------|-------------------|-----------------|------------------|--|
| CMBS   | CMBS        | PNC Mortgage Acceptance Corp. Commercial Mortgage Pass-Through Certificates, Series 2000-C1 | Cl. M        | 6/29/2000         | 7,010,000        | B3              | 2004                   | 9                       | 2006             | 5                 | 2006            | 5                | PM   |
| CMBS   | CMBS        | Wachovia Bank Commercial Mortgage Trust 2004-WHALE 4  | Cl. K        | 10/1/2004         | 31,608,000       | Baa3            | 2006                   | 10                      |                  |                   | 2006            | 10               | IM   |
| CMBS   | CMBS        | GMAC Commercial Mortgage Securities, Inc. 2000-C1   | Cl. L        | 3/16/2000         | 10,998,000       | B2              | 2006                   | 6                       | 2006             | 6                 | 2006            | 6                | PM   |
| RMBS   | RMBS        | CSFB Mortgage Pass-Through Certificates, Series 2002-9                                      | Cl. I-B-3    | 3/28/2002         | 3,668,603        | Baa2            | 2006                   | 11                      |                  |                   | 2006            | 11               | PM   |
| RMBS   | RMBS        | CSFB Mortgage Pass-Through Certificates, Series 2002-9                                      | Cl. I-B-4    | 3/28/2002         | 846,600          | Ba2             | 2006                   | 2                       | 2006             | 10                | 2006            | 2                | PM   |
| RMBS   | RMBS        | CSFB Mortgage-Backed Pass-Through Certificates, Series 2002-10                              | II-B-4       | 4/30/2002         | 799,605          | Ba3             | 2006                   | 7                       | 2006             | 1                 | 2006            | 1                | PM   |
| RMBS   | RMBS        | CSFB Mortgage-Backed Pass-Through Certificates, Series 2002-22                              | Cl. II-B-2   | 7/31/2002         | 1,566,996        | Baa3            | 2006                   | 1                       |                  |                   | 2006            | 1                | PM   |
| RMBS   | RMBS        | CSFB Mortgage-Backed Pass-Through Certificates, Series 2002-26                              | Cl. III-B    | 9/30/2002         | 2,256,000        | A3              |                        |                         | 2006             | 10                | 2006            | 10               | PM   |
| RMBS   | RMBS        | GSMPS Mortgage Loan Trust 2002-1  | Cl. B5       | 9/26/2002         | 1,164,000        | B2              | 2006                   | 10                      |                  |                   | 2006            | 10               | PM   |
| RMBS   | RMBS        | RAAC Series 2004-SP2 Trust  | Cl. B-2      | 8/6/2004          | 145,000          | B2              | 2006                   | 8                       | 2006             | 12                | 2006            | 8                | PM   |
| RMBS   | RMBS        | Structured Adjustable Rate Mortgage Loan Trust 2005-5                                       | Cl. M-3      | 4/29/2005         | 7,265,000        | Baa3            | 2006                   | 6                       |                  |                   | 2006            | 6                | PM   |
| ABS    | ABS - Other | Marne et Champagne Finance a.r.l.*  | M            | 3/16/2000         | 60,000,000       | Baa2            |                        |                         |                  |                   | 2006            | 3                | PM   |

\* This is a European security.

## Related Research

---

[Measuring Loss-Given-Default for Structured Finance Securities: An Update, December 2006 \(101284\)](#)  
[Deal Sponsor and Credit Risk of U.S. ABS and MBS Securities, December 2006 \(100872\)](#)  
[Structured Finance Rating Transitions: 1983-2006, January 2007 \(101833\)](#)  
[Default & Loss Rates of Structured Finance Securities: 1993-2005, April 2006 \(97234\)](#)  
[Default & Loss Rates of Structured Finance Securities: 1993-2004, July 2005 \(93653\)](#)  
[Default & Loss Rates of U.S. CDOs: 1993-2003, March 2005 \(91692\)](#)  
[Default & Loss Rates of Structured Finance Securities: 1993-2003, September 2004 \(88692\)](#)  
[Measuring Loss Severity Rates of Defaulted Residential Mortgage Backed Securities: A Methodology, April 2004 \(86769\)](#)  
[Payment Defaults and Material Impairments of U.S. Structured Finance Securities: 1993-2002, December 2003 \(80247\)](#)  
[Structured Finance Rating Transitions: 1983-2006 H1, August 2006 \(98577\)](#)  
[Structured Finance Rating Transitions: 1983-2005, February 2006 \(96533\)](#)  
[Structured Finance Rating Transitions: 1983-2004, February 2005 \(91392\)](#)  
[Structured Finance Rating Transitions: 1983-2003, February 2004 \(81239\)](#)  
[Structured Finance Rating Transitions: 1983-2002, January 2003 \(77291\)](#)  
[Japanese Structured Finance Rating Transitions: 1994-2006, March 2007 \(102509\)](#)  
[Asia Pacific \(ex-Japan\) Structured Finance Rating Transitions: 1990-2006 \(102095\)](#)  
[European Structured Finance Rating Transitions: 1988-2006, February 2007 \(102033\)](#)  
[European Structured Finance Rating Transitions: 1988-2005, February 2006 \(96706\)](#)  
[The Performance of Structured Finance Ratings: Mid-Year 2006 Report, September 2006 \(99034\)](#)  
[The Performance of Structured Finance Ratings: Full-Year 2005 Report, May 2006 \(97346\)](#)  
[The Performance of Structured Finance Ratings: Mid-Year 2005 Report, September 2005 \(94463\)](#)  
[The Relationship between Par Coupon Spreads and Credit Ratings in US Structured Finance, December 2005 \(95494\)](#)  
[Structured Finance Watchlist Resolutions: 1992-2003, June 2004 \(87305\)](#)  
[Corporate Default and Recovery Rates, 1920-2006, February 2007-03-28 \(102071\)](#)  
[Guide to Moody's Default Research, February 2007 Update, February 2007 \(102244\)](#)  
[Available Funds Caps and the Failure to Pay Credit Event in ABS Credit Default Swaps, December 13, 2005 \(SF 66426\)](#)  
[Treatment of Available Funds Cap Risk in Cash and Synthetic Structured Finance CDOs, December 13, 2005 \(SF 66348\)](#)  
[The Impact of Sub-Prime Residential Mortgage-Backed Securities on Moody's-Rated Structured Finance CDOs: A Preliminary Review, March 23, 2007 \(SF 95211\)](#)

*To access any of these reports, click on the entry above. Note that these references are current as of the date of publication of this report and that more recent reports may be available. All research may not be available to all clients.*

To order reprints of this report (100 copies minimum), please call 1.212.553.1658.  
Report Number: 102733

Author

Jian Hu

Senior Production Associate

Yelena Ponirovskaya

© Copyright 2007, Moody's Investors Service, Inc. and/or its licensors and affiliates including Moody's Assurance Company, Inc. (together, "MOODY'S"). All rights reserved. ALL INFORMATION CONTAINED HEREIN IS PROTECTED BY COPYRIGHT LAW AND NONE OF SUCH INFORMATION MAY BE COPIED OR OTHERWISE REPRODUCED, REPACKAGED, FURTHER TRANSMITTED, TRANSFERRED, DISSEMINATED, REDISTRIBUTED OR RESOLD, OR STORED FOR SUBSEQUENT USE FOR ANY SUCH PURPOSE, IN WHOLE OR IN PART, IN ANY FORM OR MANNER OR BY ANY MEANS WHATSOEVER, BY ANY PERSON WITHOUT MOODY'S PRIOR WRITTEN CONSENT. All information contained herein is obtained by MOODY'S from sources believed by it to be accurate and reliable. Because of the possibility of human or mechanical error as well as other factors, however, such information is provided "as is" without warranty of any kind and MOODY'S, in particular, makes no representation or warranty, express or implied, as to the accuracy, timeliness, completeness, merchantability or fitness for any particular purpose of any such information. Under no circumstances shall MOODY'S have any liability to any person or entity for (a) any loss or damage in whole or in part caused by, resulting from, or relating to, any error (negligent or otherwise) or other circumstance or contingency within or outside the control of MOODY'S or any of its directors, officers, employees or agents in connection with the procurement, collection, compilation, analysis, interpretation, communication, publication or delivery of any such information, or (b) any direct, indirect, special, consequential, compensatory or incidental damages whatsoever (including without limitation, lost profits), even if MOODY'S is advised in advance of the possibility of such damages, resulting from the use of or inability to use, any such information. The credit ratings and financial reporting analysis observations, if any, constituting part of the information contained herein are, and must be construed solely as, statements of opinion and not statements of fact or recommendations to purchase, sell or hold any securities. **NO WARRANTY, EXPRESS OR IMPLIED, AS TO THE ACCURACY, TIMELINESS, COMPLETENESS, MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OF ANY SUCH RATING OR OTHER OPINION OR INFORMATION IS GIVEN OR MADE BY MOODY'S IN ANY FORM OR MANNER WHATSOEVER.** Each rating or other opinion must be weighed solely as one factor in any investment decision made by or on behalf of any user of the information contained herein, and each such user must accordingly make its own study and evaluation of each security and of each issuer and guarantor of, and each provider of credit support for, each security that it may consider purchasing, holding or selling.

MOODY'S hereby discloses that most issuers of debt securities (including corporate and municipal bonds, debentures, notes and commercial paper) and preferred stock rated by MOODY'S have, prior to assignment of any rating, agreed to pay to MOODY'S for appraisal and rating services rendered by it fees ranging from \$1,500 to approximately \$2,400,000. Moody's Corporation (MCO) and its wholly-owned credit rating agency subsidiary, Moody's Investors Service (MIS), also maintain policies and procedures to address the independence of MIS's ratings and rating processes. Information regarding certain affiliations that may exist between directors of MCO and rated entities, and between entities who hold ratings from MIS and have also publicly reported to the SEC an ownership interest in MCO of more than 5%, is posted annually on Moody's website at [www.moody.com](http://www.moody.com) under the heading "Shareholder Relations — Corporate Governance — Director and Shareholder Affiliation Policy."



July 2008

# Default & Loss Rates of Structured Finance Securities: 1993-2007

## Summary Opinion

This *Special Comment* presents Moody's sixth annual report of the material impairment and loss rates of global structured finance securities, covering the credit performance through year-end 2007 of all structured finance securities issued since 1993. The following are the highlights of this report:

The number of newly impaired tranches rose sharply to 2,090 in 2007 from 108<sup>1</sup> in 2006. Of these, 1,780 suffered principal losses or were downgraded to Ca or C ("principal impairments"), while 310 experienced only interest shortfalls ("interest impairments"), compared to 99 principal impairments and 9 interest impairments in the prior year.

The sharp rise in impairments -- 2007 saw more impairments, both interest-only and principal, than the previous 14 years combined -- can be attributed to the US housing crisis, spawned by nationwide US home price declines combined with a sudden tightening of credit standards and rising interest rates.

The length and depth of the current prolonged US housing crisis means that impairments rates in 2008 should be expected to be at similarly elevated levels.

Not surprisingly, the 2007 impairments were concentrated in securities associated with the US residential mortgage sector, with US HEL and Global SF CDOs accounting for 66% and 25% of impairments for the year respectively.

Final loss severity rates (LGDs) on impaired securities have averaged 66% as a share of original balances for the 789 principal-impaired securities since 1993 that have reached a resolution (i.e., with no remaining principal balance) as of year-end 2007. Within that universe, tranches backed by Subprime Seconds and HELOCs have fared particularly poorly with average LGDs of around 90%.

## Table of Contents:

|   |    |
|---|----|
| Summary Opinion   | 1  |
| Issuance and Distribution of Global Structured Finance Ratings                      | 2  |
| 2007 Material Impairments   | 3  |
| Sector Specific Analysis of Impairments   | 9  |
| Loss-Given-Default on Principal-Impaired Tranches and Historical Average Loss Rates | 19 |
| Appendix I: Description of Data Sample and Glossary                                 | 24 |
| Appendix II: How to Calculate Multi-Year Material Impairment Rate and LGD Rate      | 28 |
| Appendix III: Material Impairment Rates   | 32 |
| Appendix IV: Principal Impairment Rates   | 36 |
| Appendix V: Estimated Historical Average Loss Rates                                 | 40 |
| Appendix VI: One-Year Rating Transition Matrix with a Principal Impairment Column   | 44 |
| Moody's Related Research  | 46 |

## Analyst Contacts:

**New York**                      **1.212.553.1653**

**Kumar Kanthan**  
*Senior Vice President*

**Julia Tung**  
*Vice President/Senior Credit Officer*

**Matthew Woolley**  
*Assistant Vice President/Analyst*

**Richard Cantor**  
*Group Managing Director*

**Nicolas Weill**  
*Structured Finance Chief Credit Officer*

**London**                        **44.20.7772.5454**

**David Rosa**  
*Vice President/Senior Credit Officer*

<sup>1</sup> The number of impaired securities in 2006 has been revised down due to cures.

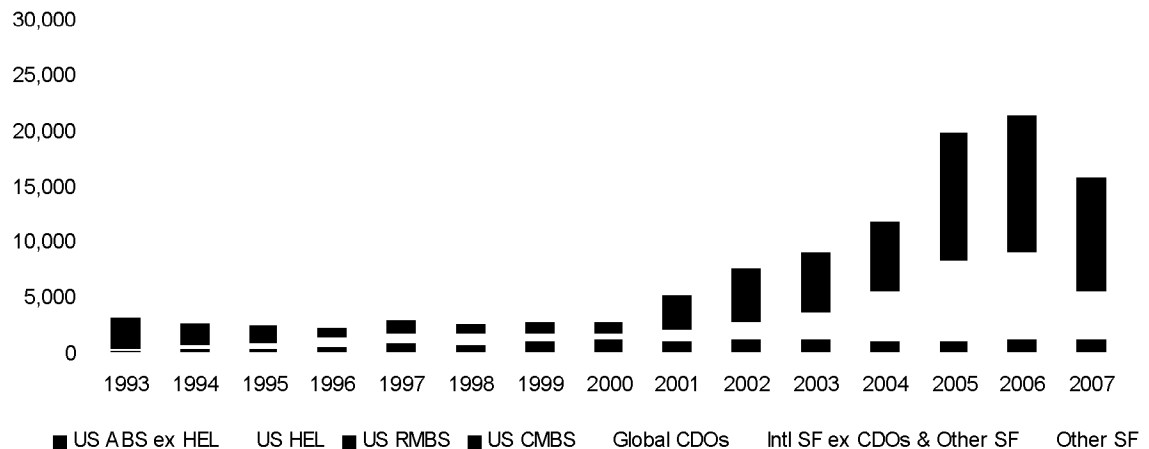




## Issuance and Distribution of Global Structured Finance Ratings

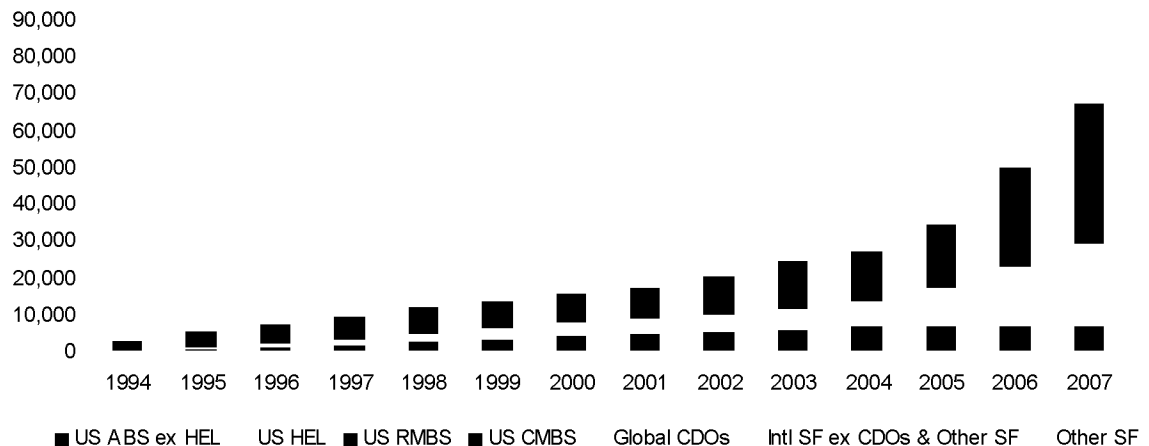
A total of 22,465 new structured finance ratings were issued in 2007. The number declined for the first time since 1998 and was down 20% from the peak issuance observed in 2006. As shown in Exhibit 1, the decline was largely driven by lower issuance in the mortgage-backed sectors with US HEL, US RMBS, and US CMBS new issuance down almost 44%, 19%, and 13%, respectively, compared to 2006 levels. In contrast, US ABS excluding HEL, Global CDOs, and the Intl SF sectors saw mild increases in rated issuance with gains limited to 3.5% or less.<sup>2</sup>

Exhibit 1: Number of New Ratings by Issuance Year



Although the growth of new issuance was down in 2007 from 2006 levels, the number of newly rated structured instruments was still relatively high and contributed to the overall increase in the number of outstanding ratings at the beginning of 2008 (104,235). Exhibit 2 shows the number of outstanding ratings at the beginning of each year from 1994 to 2007. As seen in the chart, the number of outstanding ratings has grown rapidly over the years and totaled 86,671 at the beginning of 2007. US RMBS has had the largest proportion of outstanding ratings of all sectors in all years.

Exhibit 2: Number of Ratings Outstanding at the Beginning of Each Year

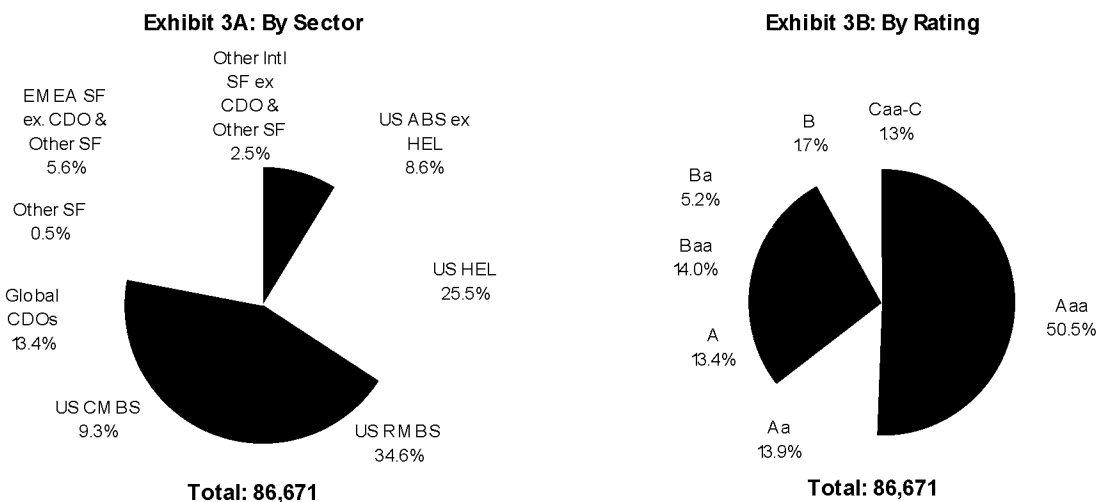


<sup>2</sup> Note that the criteria used to create the data set for this report has changed from prior years. The most notable changes are that *pari passu* tranches are no longer collapsed and wrapped tranches are included. For a more detailed description of the data sample and calculation methods, please see the Appendix.

The distribution of ratings among the various asset classes remained quite stable from 2006 to 2007; US ABS, excluding HEL, saw its share fall by 2.7 percentage points, while US RMBS increased its share by the same amount (see Exhibit 3A). Slightly more than 60% of all outstanding ratings at the beginning of 2007 were in the US RMBS and HEL sectors, underscoring the concentrated exposure of global structured finance to the US housing market.

The distribution of ratings outstanding remained heavily skewed towards the Investment Grade (IG) end of the spectrum, with slightly over 50% of all outstanding ratings as of 1/1/2007 in the Aaa category. Indeed, IG ratings made up 91.8% of all structured ratings at the start of 2007.

**Exhibit 3: Distribution of Outstanding Ratings on 1/1/2007**



## 2007 Material Impairments

### Structured Finance Material Impairments

Moody's first introduced the concept of material impairment in 2003 in order to differentiate the definition of default between corporate and structured finance sectors.<sup>3</sup> Material impairments fall into one of two categories, principal impairments and interest impairments. Principal impairments include securities that have suffered principal write-downs or principal losses at maturity and securities that have been downgraded to Ca/C, even if they have not yet experienced an interest shortfall or principal write-down.<sup>4</sup> Interest impairments, or interest-impaired securities, include securities that are not principal impaired and have experienced only interest shortfalls.

The actual impairment classification is based on a security's status at the end of the study period. For example, a security that initially experienced an interest shortfall before suffering a principal write-down several months later would be classified as a principal impairment with impairment date equal to when the interest shortfall occurred. If, however, the interest shortfall is cured before the principal write-down occurs, then the impairment date coincides with the date of the principal write-down.

Moody's does not treat tranches that are under-collateralized or implicitly construed to be written down as material impairments, but tranches that are not paying current interest, but rather paying in kind (PIKing) are considered to be materially impaired.

<sup>3</sup> See Moody's Special Comment, "Payment Defaults and Material Impairments of U.S. Structured Finance Securities: 1993-2002," December 2003.

<sup>4</sup> Securities that have been downgraded to Ca/C are virtually certain to sustain losses ultimately.

## 2007 Material Impairment Summary

2007 saw more impairments, both interest-only and principal, than the previous 14 years combined (see Exhibit 4). US home price declines, combined with tightening credit standards and rising interest rates, contributed to a large number of impairments of securities associated with the US residential mortgage sector. Credit markets seized, leading to extensions of extendible ABCP programs and the outright failure of the SIV market as sponsors were unable to issue new liabilities.

Exhibit 4 presents the total number of material impairments by year of impairment. A total of 2,090 securities were newly impaired in 2007, of which 1,780 were principal impairments and 310 were interest impairments. Note that interest impairments are relatively infrequent in prior years. We designate bonds that have experienced interest impairments as either cured (with no impairment) if interest shortfalls are cured or principal impaired once they become principal impaired. As can be seen from the chart, there are very few interest impairments that did not either eventually become principal impairments or become cured.

**Exhibit 4: Structured Finance Material Impairments by Impairment Year**



At 37.2%, US HEL suffered by far the highest trailing 12-month speculative grade (SG) impairment rate (see Exhibit 5), and as US HEL represents roughly one quarter of the total global structured universe, the overall trailing 12-month SG impairment rate was 11.3%.

**Exhibit 5: 2007 Material Impairments<sup>5</sup>**

|                                  | Principal Impairments | Interest Impairments | Total        | Investment Grade | Speculative Grade | All         |
|----------------------------------|-----------------------|----------------------|--------------|------------------|-------------------|-------------|
| US ABS ex HEL                    | 9                     | 11                   | 20           | 0.0%             | 4.6%              | 0.3%        |
| US HEL (includes subprime)       | 1,384                 | 0                    | 1,384        | 2.8%             | 37.2%             | 5.1%        |
| US RMBS (includes Alt-A)         | 112                   | 0                    | 112          | 0.2%             | 5.1%              | 0.4%        |
| US CMBS                          | 5                     | 8                    | 13           | 0.0%             | 0.7%              | 0.2%        |
| Global CDOs                      | 246                   | 291                  | 537          | 2.5%             | 6.4%              | 2.9%        |
| Other Structured Finance         | 21                    | 0                    | 21           | 4.0%             | 0.0%              | 3.7%        |
| EMEA ex CDO and Other SF         | 3                     | 0                    | 3            | 0.0%             | 1.1%              | 0.1%        |
| Other Intl ex CDO and Other SF   | 0                     | 0                    | 0            | 0.0%             | 0.0%              | 0.0%        |
| <b>Global Structured Finance</b> | <b>1,780</b>          | <b>310</b>           | <b>2,090</b> | <b>1.1%</b>      | <b>11.3%</b>      | <b>1.9%</b> |

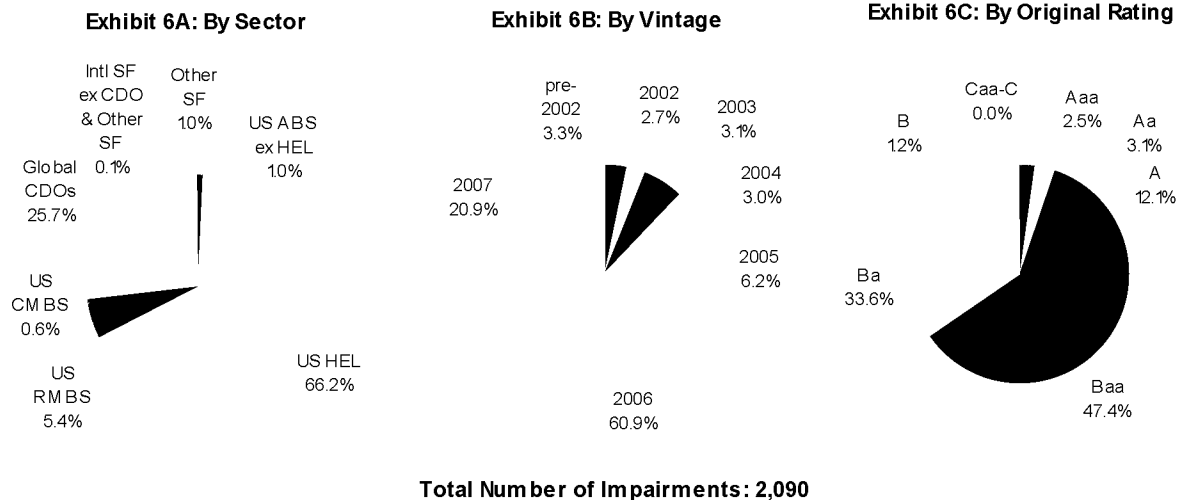
<sup>5</sup> Note that the 12-month impairment rates provided in this table and throughout the report do not take into account those newly impaired securities that were issued in 2007 as the last cohort was formed at the beginning of 2007. Please refer to Exhibit 6B for more information about the distribution of new impairments by vintage.

The distribution of 2007 material impairments in three different dimensions is summarized below in Exhibit 6. Exhibit 6A shows the distribution of impairments by sector and is a graphical version of the "Total" column in Exhibit 5. Again, US HEL comprises the majority of impairments at 66.2% of total impairments, while Global CDOs are second with 25.7% of 2007 impairments. Within the Global CDO sector, over 96% of 2007 impairments were from the structured finance CDO subsector and around 2% were from the market value CDO subsector, with only 1% related to corporate CLOs and CBOs.

Slicing the 2007 impairment sample by vintage (Exhibit 6B) shows the heightened risk of the 2006 and 2007 vintages. Over 60% of 2007 impairments came from the 2006 vintage, and the already poor performance of 2007 vintage issuance is demonstrated by its 21% share of 2007 material impairments. That is, of the 2,090 impaired tranches in 2007, 436 were issued in 2007. The poor performance of 2007 vintage tranches (for certain asset classes) so soon after issuance suggests dim prospects for the overall performance of 2007 vintage issuance in 2008 and beyond.

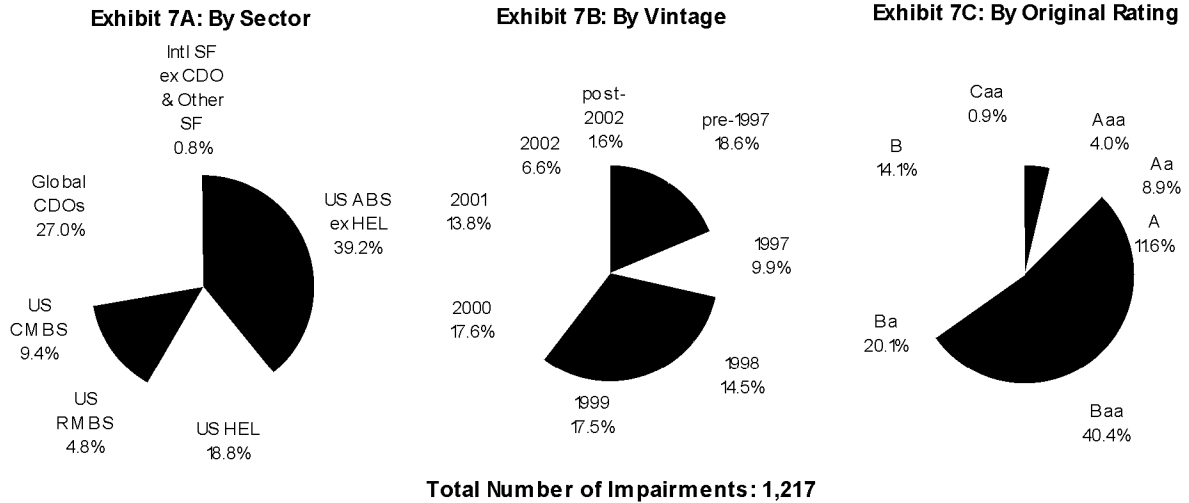
Exhibit 6C indicates that roughly 2/3 of securities impaired in 2007 originally held investment grade ratings.

**Exhibit 6: Distribution of Material Impairments in 2007**



The poor performance of the US HEL sector in 2007 is put into perspective when compared to the distribution of all material impairments prior to 2007 (Exhibit 7). US HEL comprises only about 19% of the pre-2007 impairment experience, while about 40% of historical impairments have been attributed to US ABS ex. HEL, particularly the manufactured housing, franchise loan, and equipment lease subsectors (84% of all historical US ABS ex. HEL impairments).

### Exhibit 7: Distribution of Material Impairments prior to 2007



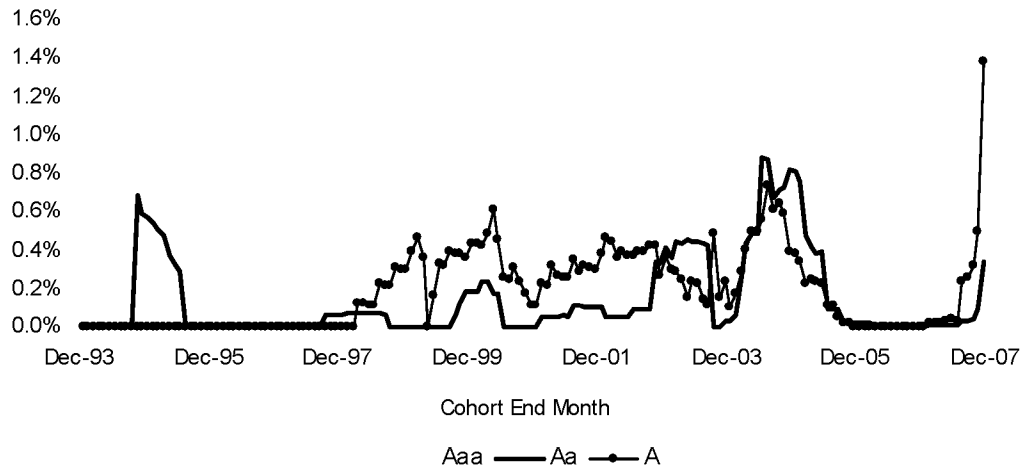
The distribution of impairments prior to 2007 is reasonably well-diversified among various vintages with the 2003-2006 vintages performing better than any single-year vintage (excluding the pre-1997 experience). The high number of 2006 and 2007 vintage impairments is both a natural result of the rapid expansion of the structured finance market to date, and the poor performance of many securities from these vintages.

When examined through the lens of original rating, however, the 2007 impairment experience does not look as divergent from historical trends. Indeed, a plurality of impairments were originally rated in the broad Baa category both in the 2007 and prior-to-2007 samples. The 2007 sample actually has a lower share of impairments that were rated Aaa-A, relative to the historical average, and a higher share of 2007 impairments came from the Baa and Ba categories, again relative to the historical experience.

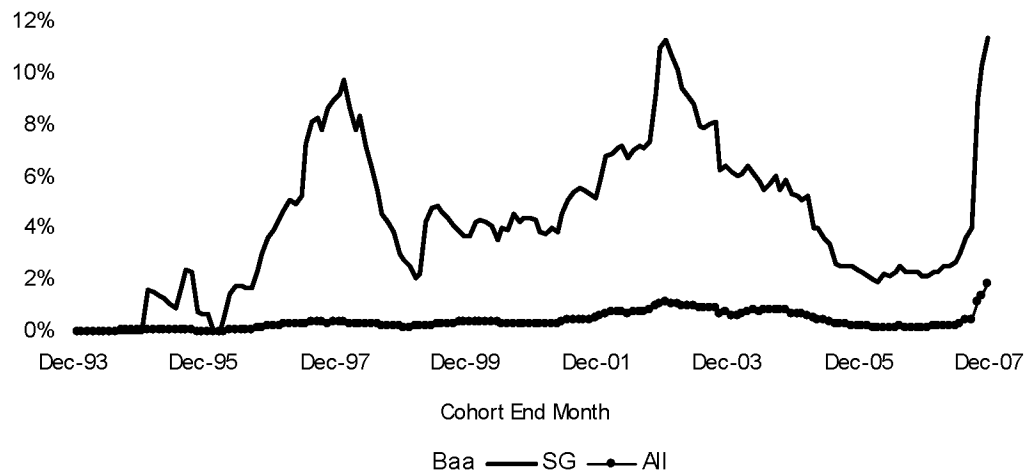
The time-series plots of trailing 12-month impairment rates shown in Exhibit 8 put into relief the recent deterioration of the performance of A- and Baa-rated tranches. Both A- and Baa-rated tranches have hit all-time high impairment rates in the most recent cohorts, and the SG impairment rate is at the previous high of 11.3% reached by the cohort ending in January 2003. The Aaa cohort has reached its previous high of 0.1% as well, and the result of such poor performance by virtually all rating classes is an all-time high trailing 12-month impairment rate for the entire rated universe.

## Exhibit 8: Trailing 12-Month Impairment Rates by Cohort Rating

### Exhibit 8A: Trailing 12-month Impairment Rates by Rating (Aaa, Aa, A)



### Exhibit 8B: Trailing 12-month Impairment Rates by Rating (Baa, SG, All)



The weak performance of the 2006 and 2007 vintages is also highlighted by Exhibit 9 which shows that, in terms of number of impairments, those vintages have already surpassed all prior vintages. In terms of cumulative impairment rates, the 2006 vintage ranks fourth-highest among all the vintages, after just two years of impairment experience. Similarly, the 2007 vintage, after just one year of impairment experience, has already surpassed the cumulative impairment rates of six prior vintages.

**Exhibit 9: Structured Finance Material Impairments by Closing Year**

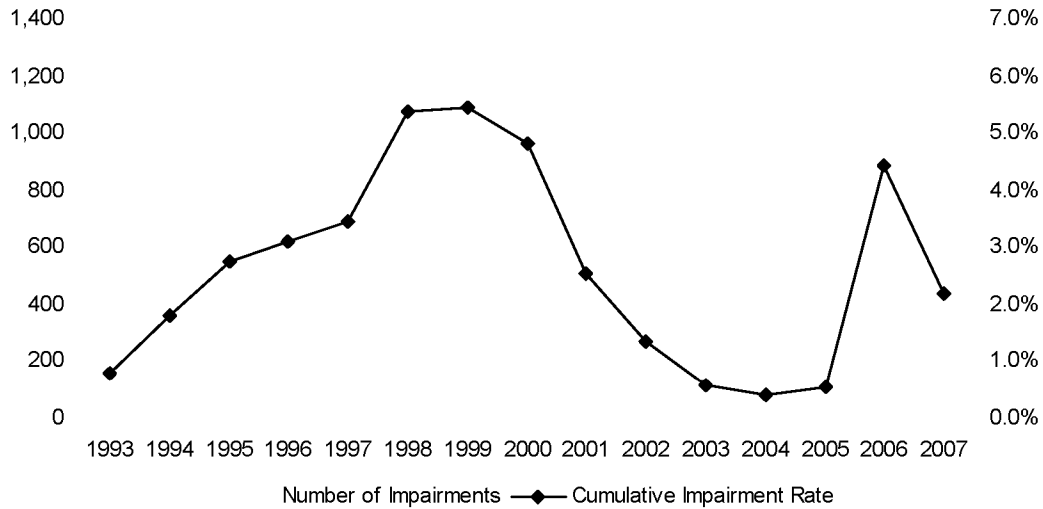
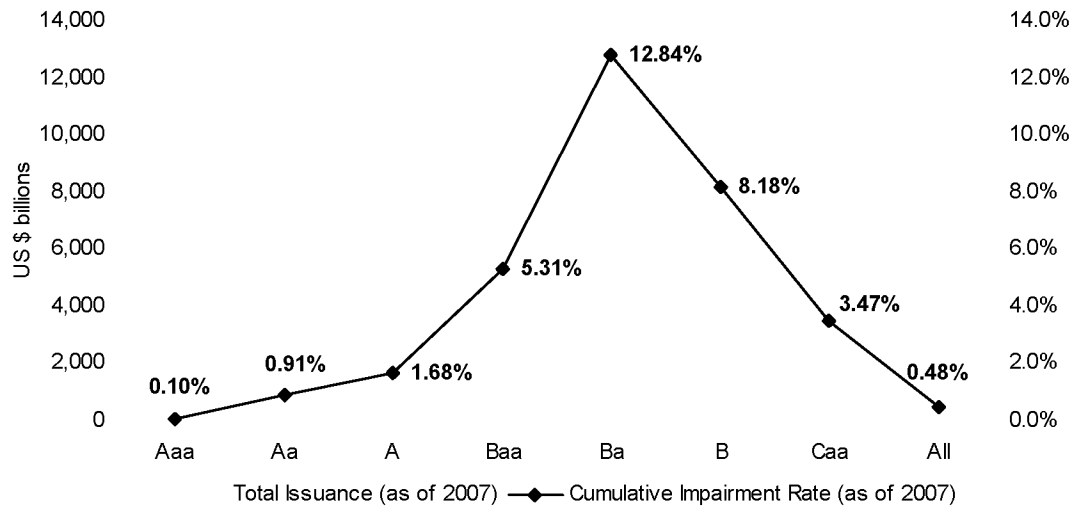


Exhibit 10 provides a longer historical look at the breakdown of issuance and cumulative impairment rates among broad rating categories, and illustrates that the vast majority of issuance by volume (87%) has been originally rated Aaa.<sup>6</sup> Aa, A, and Baa issuance represent 5%, 4%, and 3% shares of total historical issuance, respectively, while speculative grade issuance is less than 1% of all structured issuance.

**Exhibit 10: Cumulative Material Impairment Rate by Original Rating and Volume**



Cumulative impairment rates increase as rating decreases down to the Ba category, at which point cumulative impairment rates fall. This may seem counterintuitive at first, but the non-monotonicity can be explained by looking at the small amount of originally-rated Ba and Caa securities. Indeed, B- and Caa-rated issuance represents only 0.16% of the total amount, so a relatively small number of well- or poorly-performing low-rated tranches are enough to cause large swings in cumulative impairment rates for those rating categories.

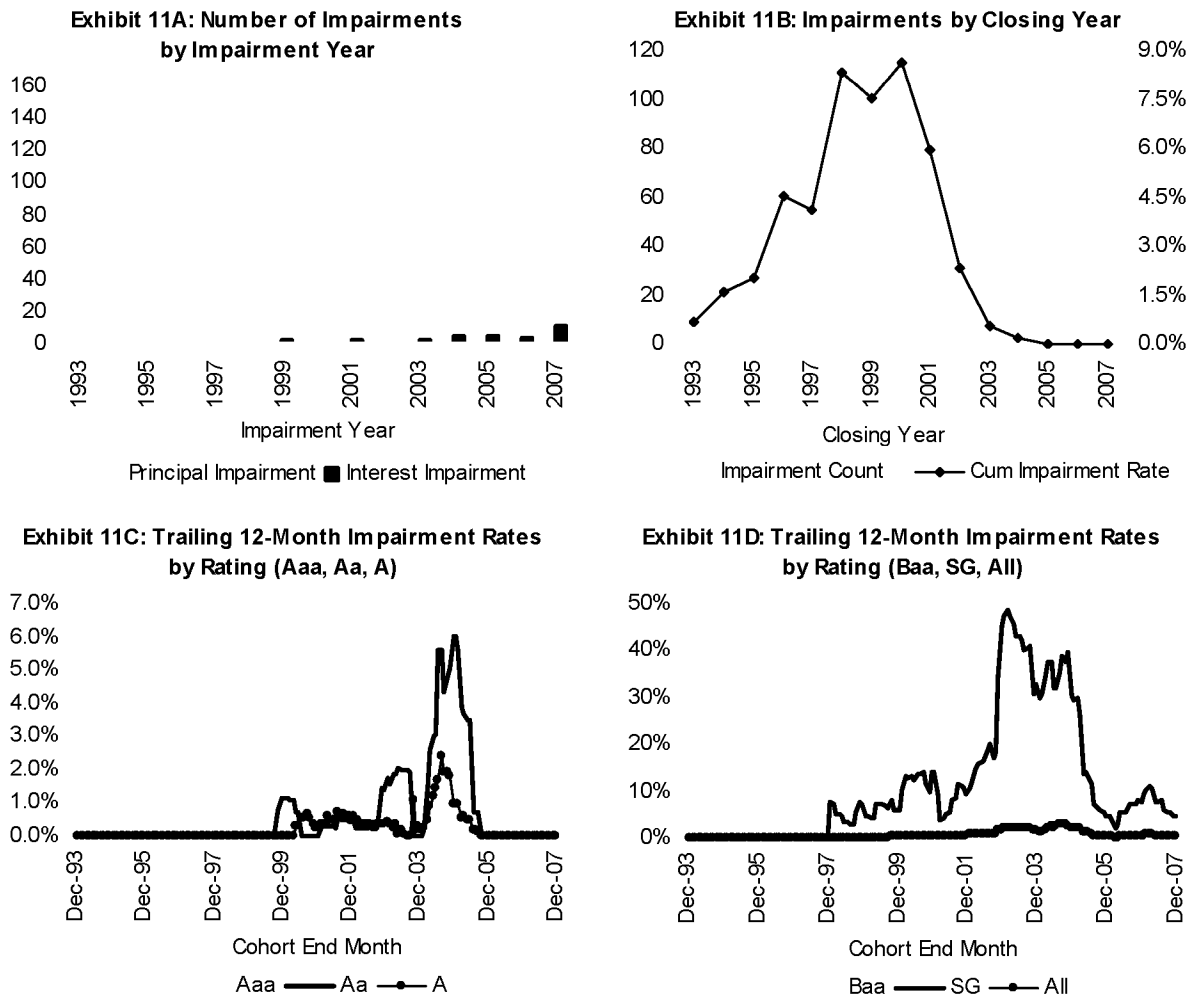
<sup>6</sup> Note: "Other SF" is excluded from the volume calculations in Exhibit 10 as historical issuance in this category is not as well catalogued.

## Sector Specific Analysis of Impairments

### US ABS ex. HEL

Although there were slightly more interest impairments in 2007 than 2006, there were fewer principal and overall impairments in the US ABS ex. HEL asset class (see Exhibit 11). Indeed, when the total size of the sector is taken into account, the impairment rates are at-or-near all-time lows for virtually all rating categories.

**Exhibit 11: US ABS ex HEL Material Impairment Trends**

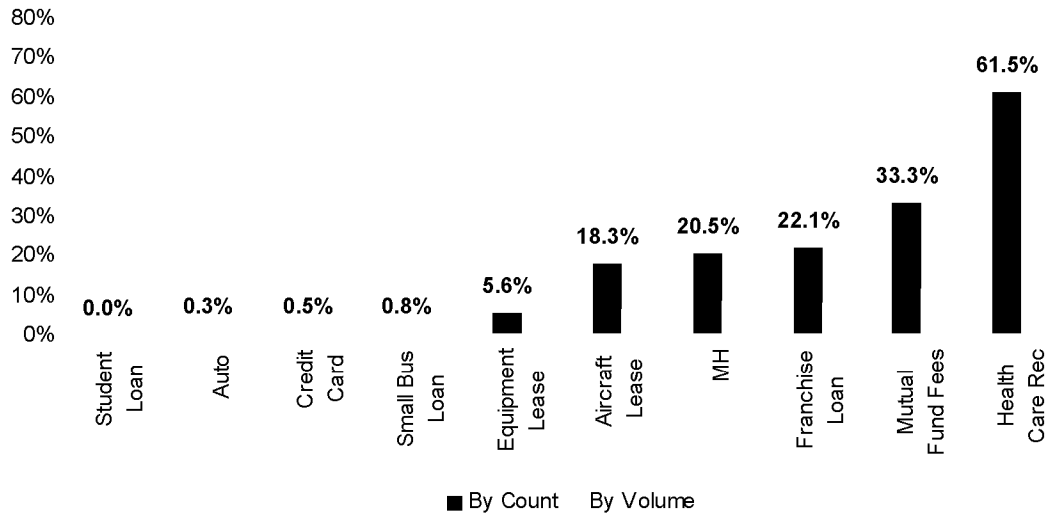


Of the twenty 2007 US ABS ex. HEL impairments, 14 were in aircraft lease deals, 3 were backed by equipment leases, and the remaining 3 were related to other asset classes. All of the 2007 impairments were associated with deals that closed in 2002 or earlier, showing that the phenomenon of weak performance of 2006 and 2007 vintages has not been evident so far in the US ABS ex. HEL sector.

The distribution of historical US ABS ex. HEL impairments by asset type (see Exhibit 12), reveals that the three major asset classes – student loans, autos, and credit cards – have experienced few impairments while a vast majority of the impairments are accounted for by a few troubled sectors including: health care receivables, mutual fund fees, franchise loans, manufactured housing (MH), aircraft lease, and equipment lease.



**Exhibit 12: Cumulative Impairment Rates for US ABS by Asset Type**



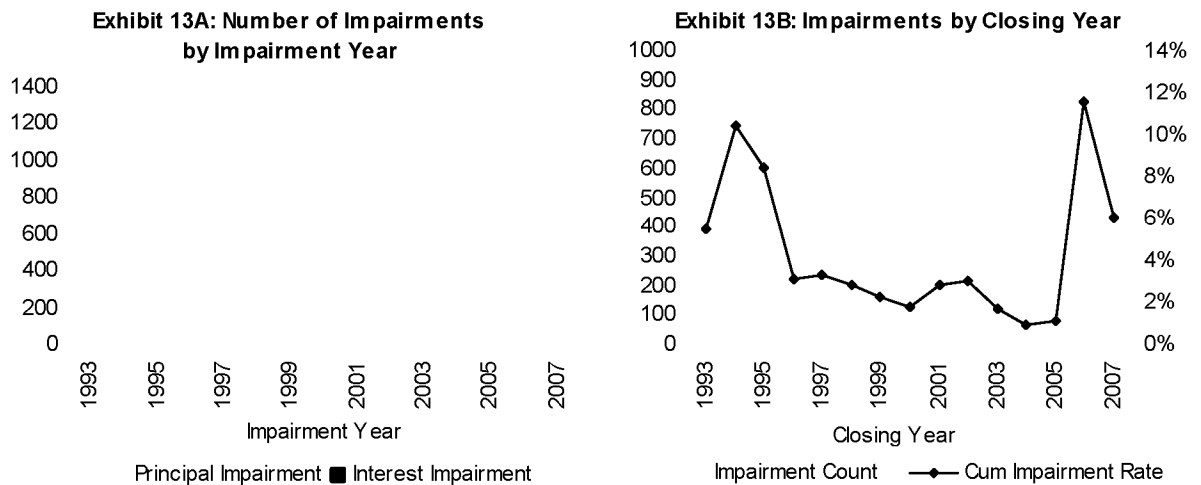
**US HEL**

US HEL experienced both the highest share of impairments in 2007 relative to other asset classes, and the poorest performance relative to the historical record of the asset class (see Exhibit 13). The total number of new impairments in 2007 amounted to 1,384, far exceeding the sum of all the historical impairments in the sector. Of those new impairments, all of which were principal impairments, 84% were from the 2006 and 2007 vintages.

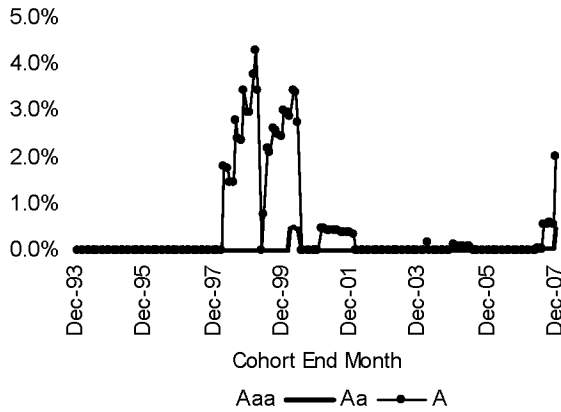
Aaa-rated securities experienced no impairments during the year, but the trailing 12-month impairment rates rose sharply for both the investment-grade and speculative-grade ratings categories.

A more detailed analysis of impairments in the US HEL and US RMBS sectors is found on pages 12-15.

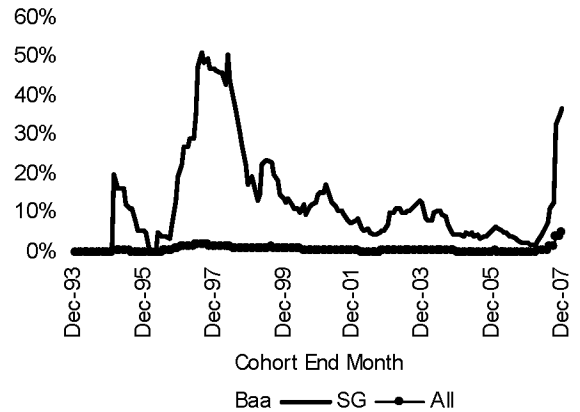
**Exhibit 13: US HEL Material Impairment Trends**



**Exhibit 13C: Trailing 12-Month Impairment Rates by Rating (Aaa, Aa, A)**



**Exhibit 13D: Trailing 12-Month Impairment Rates by Rating (Baa, SG, All)**

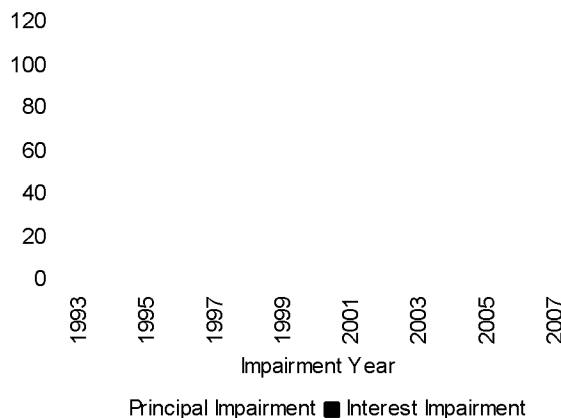


## US RMBS

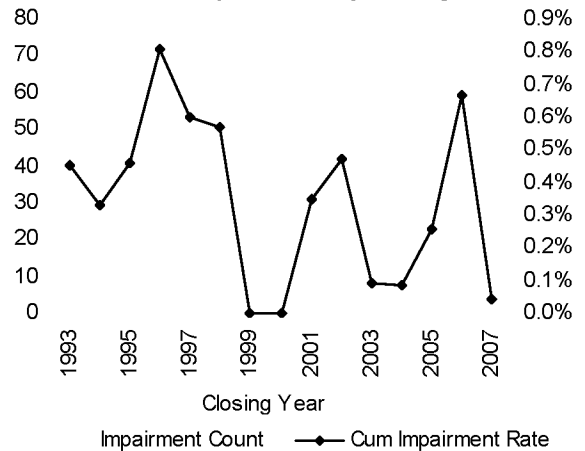
The total number of new impairments in the US RMBS sector in 2007 amounted to 112 (see Exhibit 14). Similar to the US HEL sector, the number of new impairments far exceeded the sum of all the historical impairments in the sector. Of those new impairments, all of which were principal impairments, 64% were from the 2006 and 2007 vintages, and an additional 21% were from the 2005 vintage. Approximately 85% of the new US RMBS impairments occurred within the Alt-A subsector, while only one of the impairments, a security issued in 2002, was backed by Jumbo/Prime collateral.

**Exhibit 14: US RMBS Material Impairment Trends**

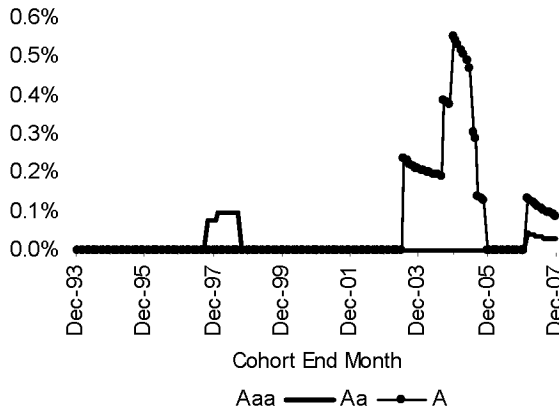
**Exhibit 14A: Number of Impairments by Impairment Year**



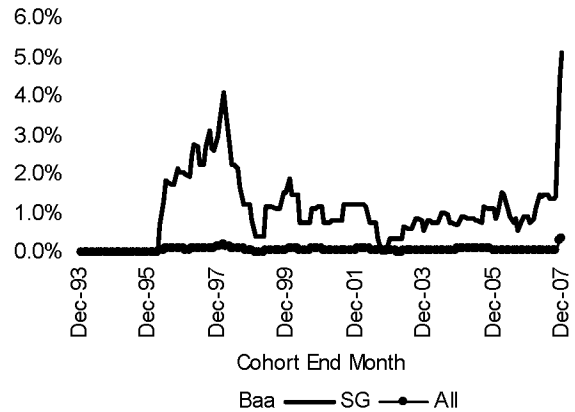
**Exhibit 14B: Impairments by Closing Year**



**Exhibit 14C: Trailing 12-Month Impairment Rates by Rating (Aaa, Aa, A)**



**Exhibit 14D: Trailing 12-Month Impairment Rates by Rating (Baa, SG, All)**

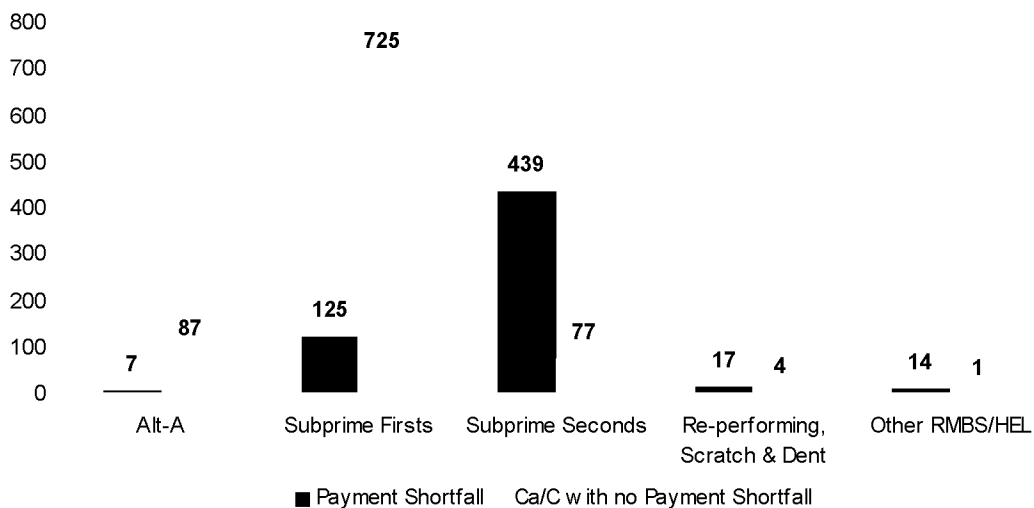


Of the new impairments, only one was related to a Aa-rated security and only two were related to A-rated securities, with the vast majority of impairments concentrated in securities rated Baa and lower. That breakdown can be seen in the trailing 12-month impairment rates chart which shows the sharpest rise in impairment rates for Baa securities and for the broad SG rating category.

### US RMBS and HEL Impairments by Loan Type and Vintage

Drilling further into the 2007 US RMBS and HEL impairments (see Exhibit 15), we see that the highest number of impairments involved securities backed by subprime first liens, followed by subprime seconds, and then by Alt-A transactions. The fewer number of impairments among subprime seconds rather than subprime firsts transactions is more indicative of the relative sizes of the two sectors rather any suggestion of better performance among subprime seconds. In fact, in terms of impairments involving a payment shortfall, 439 of the 516 impaired securities backed by subprime seconds experienced a payment shortfall by the end of 2007 versus 125 of the 850 impaired securities backed by subprime firsts, an indication of the increased speed at which losses were accumulating for subprime second transactions.

**Exhibit 15: US RMBS/HEL Impairments in 2007 by Loan Type**



The impairment performance of the worst performing vintages (2005 to 2007) for the worst performing sectors (subprime firsts, subprime seconds, and Alt-A) is broken out by rating category in Exhibit 16 to Exhibit 18. In terms of cumulative impairments, for subprime firsts and subprime seconds transactions, the 2005 vintage has seen the best performance, the 2006 vintage has seen the worst performance, and the 2007 vintage performance has been in between, though given its low amount of seasoning, it may ultimately perform worse than the 2006 vintage as time passes. The 2006 vintage of subprime seconds has seen 88%, 50%, and 9.8% impairment rates of Baa, A, and Aa securities respectively. The 2006 vintage of subprime firsts has performed better in relative terms with impairment rates of 18%, 0.1%, and 0.0% among Baa, A, and Aa securities respectively. In relative terms, the 2006 vintage of Alt-A deals has performed even better with only a 5% impairment rate for Baa securities and no impairments among A- and higher-rated securities. For Alt-A transactions, the 2007 vintage has been the best performing in terms of cumulative impairments, having seen no impairments to date.

### Exhibit 16: Impairments among Subprime First Lien Backed US HEL

| Original Rating | Impaired | Rated | % Impaired | Impaired | Rated   | % Impaired |
|-----------------|----------|-------|------------|----------|---------|------------|
| Aaa             | 0        | 2,104 | 0.0%       | 0        | 348,624 | 0.0%       |
| Aa              | 0        | 1,006 | 0.0%       | 0        | 36,348  | 0.0%       |
| A               | 0        | 1,028 | 0.0%       | 0        | 19,566  | 0.0%       |
| Baa             | 0        | 1,095 | 0.0%       | 0        | 13,730  | 0.0%       |
| Ba              | 3        | 337   | 0.9%       | 31       | 3,336   | 0.9%       |
| B               | 1        | 1     | 100.0%     | 7        | 7       | 100.0%     |
| Total           | 4        | 5,571 | 0.1%       | 38       | 421,611 | 0.0%       |

| Original Rating | Impaired | Rated | % Impaired | Impaired | Rated   | % Impaired |
|-----------------|----------|-------|------------|----------|---------|------------|
| Aaa             | 0        | 2,111 | 0.0%       | 0        | 347,306 | 0.0%       |
| Aa              | 0        | 1,266 | 0.0%       | 0        | 40,938  | 0.0%       |
| A               | 1        | 1,296 | 0.1%       | 13       | 21,232  | 0.1%       |
| Baa             | 234      | 1,293 | 18.1%      | 2,763    | 14,900  | 18.5%      |
| Ba              | 302      | 450   | 67.1%      | 3,078    | 4,496   | 68.5%      |
| B               | 0        | 0     | NA         | 0        | 0       | NA         |
| Total           | 537      | 6,416 | 8.4%       | 5,853    | 428,873 | 1.4%       |

| Original Rating | Impaired | Rated | % Impaired | Impaired | Rated   | % Impaired |
|-----------------|----------|-------|------------|----------|---------|------------|
| Aaa             | 0        | 1,055 | 0.0%       | 0        | 143,438 | 0.0%       |
| Aa              | 0        | 646   | 0.0%       | 0        | 17,997  | 0.0%       |
| A               | 6        | 621   | 1.0%       | 79       | 8,815   | 0.9%       |
| Baa             | 111      | 577   | 19.2%      | 1,249    | 6,416   | 19.5%      |
| Ba              | 66       | 123   | 53.7%      | 759      | 1,292   | 58.7%      |
| B               | 0        | 1     | 0.0%       | 0        | 12      | 0.0%       |
| Total           | 183      | 3,023 | 6.1%       | 2,086    | 177,970 | 1.2%       |

**Exhibit 17: Impairments among Subprime Second Lien Backed US HEL**

| Original Rating | Impaired | Rated | % Impaired | Impaired | Rated  | % Impaired |
|-----------------|----------|-------|------------|----------|--------|------------|
| Aaa             | 0        | 110   | 0.0%       | 0        | 14,508 | 0.0%       |
| Aa              | 0        | 100   | 0.0%       | 0        | 2,197  | 0.0%       |
| A               | 0        | 115   | 0.0%       | 0        | 1,395  | 0.0%       |
| Baa             | 19       | 144   | 13.2%      | 130      | 1,162  | 11.2%      |
| Ba              | 51       | 65    | 78.5%      | 369      | 444    | 83.2%      |
| B               | 0        | 0     | NA         | 0        | 0      | NA         |
| Total           | 70       | 534   | 13.1%      | 499      | 19,707 | 2.5%       |

| Original Rating | Impaired | Rated | % Impaired | Impaired | Rated  | % Impaired |
|-----------------|----------|-------|------------|----------|--------|------------|
| Aaa             | 0        | 184   | 0.0%       | 0        | 23,915 | 0.0%       |
| Aa              | 18       | 183   | 9.8%       | 309      | 3,507  | 8.8%       |
| A               | 94       | 187   | 50.3%      | 805      | 1,864  | 43.2%      |
| Baa             | 188      | 214   | 87.9%      | 1,281    | 1,472  | 87.0%      |
| Ba              | 99       | 99    | 100.0%     | 670      | 670    | 100.0%     |
| B               | 0        | 0     | NA         | 0        | 0      | NA         |
| Total           | 399      | 867   | 46.0%      | 3,065    | 31,430 | 9.8%       |

| Original Rating | Impaired | Rated | % Impaired | Impaired | Rated  | % Impaired |
|-----------------|----------|-------|------------|----------|--------|------------|
| Aaa             | 0        | 65    | 0.0%       | 0        | 9,220  | 0.0%       |
| Aa              | 0        | 48    | 0.0%       | 0        | 710    | 0.0%       |
| A               | 2        | 59    | 3.4%       | 23       | 596    | 3.8%       |
| Baa             | 24       | 61    | 39.3%      | 108      | 477    | 22.7%      |
| Ba              | 11       | 21    | 52.4%      | 100      | 223    | 44.6%      |
| B               | 0        | 0     | NA         | 0        | 0      | NA         |
| Total           | 37       | 254   | 14.6%      | 230      | 11,226 | 2.1%       |

**Exhibit 18: Impairments among Alt-A Backed US HEL**

| Original Rating | Impaired | Rated | % Impaired | Impaired | Rated   | % Impaired |
|-----------------|----------|-------|------------|----------|---------|------------|
| Aaa             | 0        | 4,826 | 0.0%       | 0        | 363,961 | 0.0%       |
| Aa              | 0        | 895   | 0.0%       | 0        | 13,246  | 0.0%       |
| A               | 0        | 556   | 0.0%       | 0        | 5,475   | 0.0%       |
| Baa             | 16       | 622   | 2.6%       | 93       | 3,829   | 2.4%       |
| Ba              | 7        | 108   | 6.5%       | 20       | 533     | 3.8%       |
| B               | 0        | 17    | 0.0%       | 0        | 45      | 0.0%       |
| Total           | 23       | 7,024 | 0.3%       | 113      | 387,090 | 0.0%       |

| Original Rating | Impaired | Rated | % Impaired | Impaired | Rated   | % Impaired |
|-----------------|----------|-------|------------|----------|---------|------------|
| Aaa             | 0        | 4,836 | 0.0%       | 0        | 369,593 | 0.0%       |
| Aa              | 0        | 1,317 | 0.0%       | 0        | 15,979  | 0.0%       |
| A               | 0        | 879   | 0.0%       | 0        | 5,317   | 0.0%       |
| Baa             | 40       | 810   | 4.9%       | 158      | 3,876   | 4.1%       |
| Ba              | 21       | 149   | 14.1%      | 93       | 714     | 13.0%      |
| B               | 3        | 14    | 21.4%      | 2        | 49      | 3.4%       |
| Total           | 64       | 8,005 | 0.8%       | 253      | 395,529 | 0.1%       |

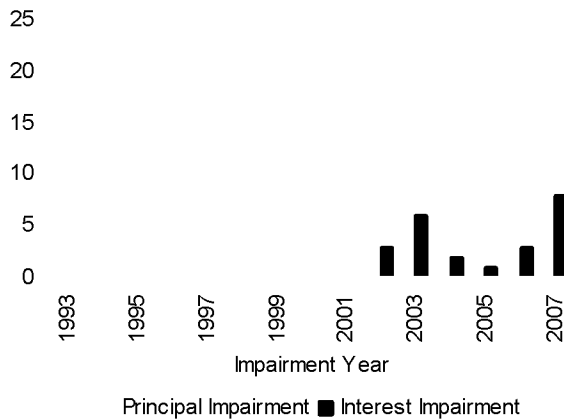
| Original Rating | Impaired | Rated | % Impaired | Impaired | Rated   | % Impaired |
|-----------------|----------|-------|------------|----------|---------|------------|
| Aaa             | 0        | 3,312 | 0.0%       | 0        | 216,857 | 0.0%       |
| Aa              | 0        | 993   | 0.0%       | 0        | 9,145   | 0.0%       |
| A               | 0        | 580   | 0.0%       | 0        | 2,840   | 0.0%       |
| Baa             | 0        | 512   | 0.0%       | 0        | 2,023   | 0.0%       |
| Ba              | 0        | 81    | 0.0%       | 0        | 432     | 0.0%       |
| B               | 0        | 18    | 0.0%       | 0        | 79      | 0.0%       |
| Total           | 0        | 5,496 | 0.0%       | 0        | 231,376 | 0.0%       |

## US CMBS

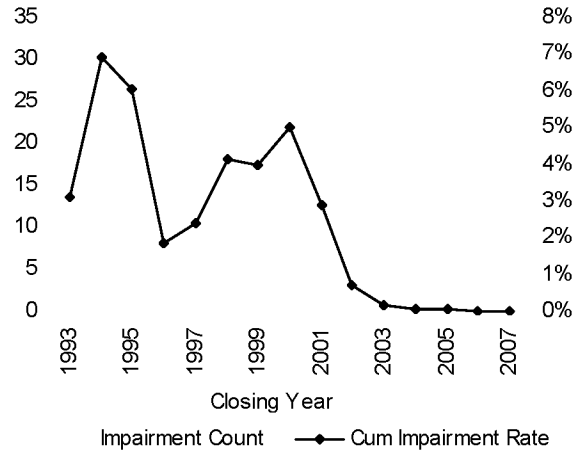
Similar to the US ABS ex. HEL sector, the US CMBS sector experienced stable performance with only 13 new impairments during 2007 compared with 23 new impairments in 2006 (see Exhibit 19). All of the 2007 impairments were associated with deals that closed in 2002 or earlier, showing that the phenomenon of weak performance of 2006 and 2007 RMBS and HEL vintages has not been evident so far in the US CMBS sector.

**Exhibit 19: US CMBS Material Impairment Trends**

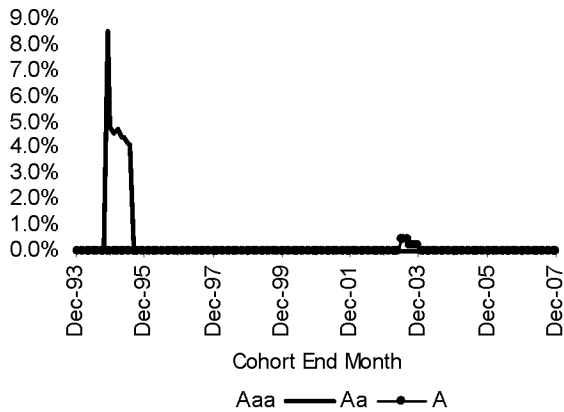
**Exhibit 19A: Number of Impairments by Impairment Year**



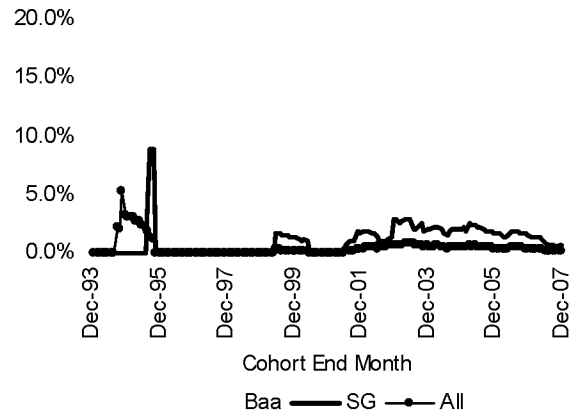
**Exhibit 19B: Impairments by Closing Year**



**Exhibit 19C: Trailing 12-Month Impairment Rates by Rating (Aaa, Aa, A)**



**Exhibit 19D: Trailing 12-Month Impairment Rates by Rating (Baa, SG, All)**

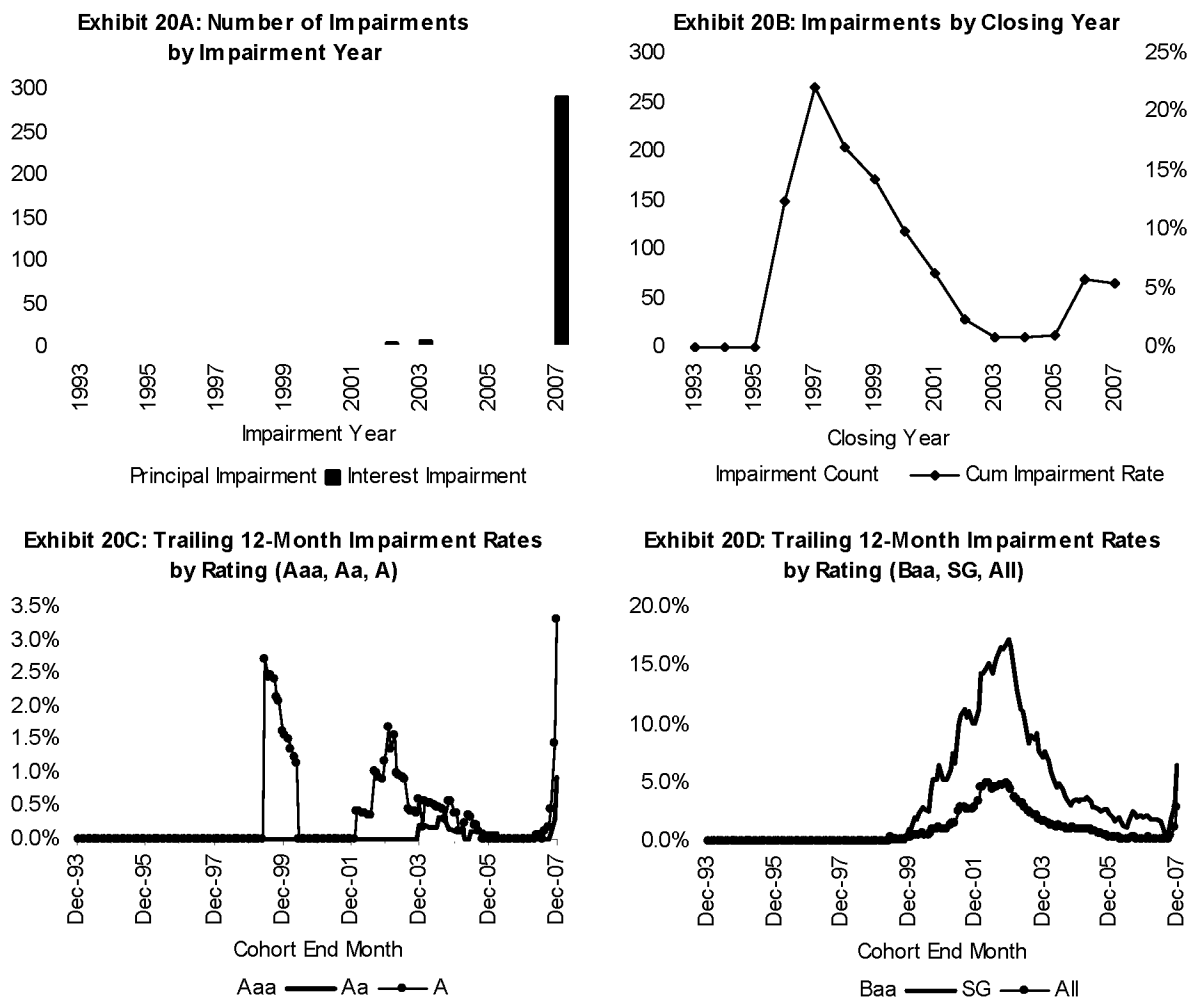


## Global CDOs

Similar to the US HEL and RMBS sectors, global CDOs experienced weak performance in 2007 with the 537 new impairments during the year exceeding the sum of all historical impairments in the sector (see Exhibit 20). Of the new impairments, 246 and 291 were associated with principal and interest impairments, respectively, and 87% were associated with 2006 and 2007 vintages.

It should be noted that over 96% of the 2007 impairments were SF CDOs and around 2% were from the market value CDO subsector, with only 1% related to corporate CLOs and CBOs.

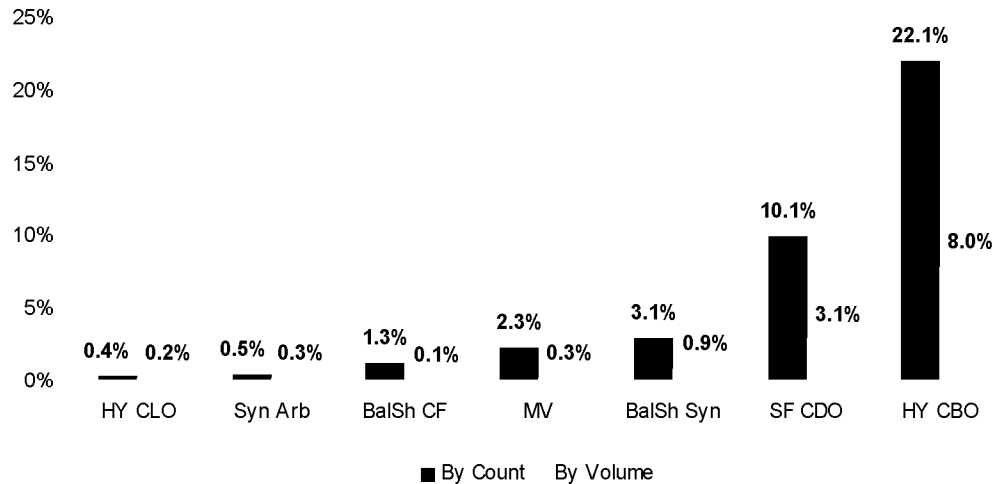
**Exhibit 20: Global CDO Material Impairment Trends**



The extent of the poor performance of the SF CDO subsector is evident across the rating categories, with the trailing 12-month impairment rates for global CDOs rising sharply for Aaa, Aa, A and Baa securities as well as for the SG and All ratings categories.

The poor performance of SF CDOs is also highlighted in Exhibit 21 which shows that, within the Global CDO sector, the performance of HY CBOs and of SF CDOs has been significantly worse than that of the other subsectors.



**Exhibit 21: 1993-2007 Global CDOs Cumulative Impairment Rates by Deal Type**

Indeed, HY CBOs have experienced twice as high a lifetime impairment rate (measured as the total number of impairments over the total lifetime issuance) as the SF CDO sector, the next highest sector. In all cases, the lifetime impairment rate by volume is less than the lifetime impairment rate by count.

The impairment performance of the worst performing vintages (2006 and 2007) for the SF CDO subsector is broken out by rating category in Exhibit 22. The impairment performance of the 2006 and 2007 SF CDO vintages has been somewhat comparable, with the former experiencing 3.7% (by dollar volume) and the latter experiencing 5.0% impairment rates to date across all rating categories. The 2006 and 2007 vintages have so far seen Aaa impairment rates on the order of 1% to 3% with Baa impairment rates on the order of 30% to 35%.

**Exhibit 22: Impairments among SF CDOs Issued in 2006 and 2007**

| Original Rating | Impaired | Rated | % Impaired | Impaired | Rated   | % Impaired |
|-----------------|----------|-------|------------|----------|---------|------------|
| Aaa             | 21       | 633   | 3.3%       | 2,688    | 182,219 | 1.5%       |
| Aa              | 20       | 368   | 5.4%       | 967      | 16,138  | 6.0%       |
| A               | 60       | 328   | 18.3%      | 1,591    | 8,461   | 18.8%      |
| Baa             | 99       | 295   | 33.6%      | 2,152    | 6,091   | 35.3%      |
| Ba              | 53       | 120   | 44.2%      | 583      | 1,429   | 40.8%      |
| B               | 2        | 2     | 100.0%     | 51       | 51      | 100.0%     |
| Total           | 255      | 1,746 | 14.6%      | 8,032    | 214,389 | 3.7%       |

| Original Rating | Impaired | Rated | % Impaired | Impaired | Rated   | % Impaired |
|-----------------|----------|-------|------------|----------|---------|------------|
| Aaa             | 21       | 637   | 3.3%       | 4,212    | 149,105 | 2.8%       |
| Aa              | 20       | 253   | 7.9%       | 1,013    | 12,552  | 8.1%       |
| A               | 57       | 232   | 24.6%      | 1,590    | 6,479   | 24.5%      |
| Baa             | 76       | 241   | 31.5%      | 1,590    | 5,037   | 31.6%      |
| Ba              | 27       | 66    | 40.9%      | 350      | 873     | 40.1%      |
| B               | 0        | 0     | NA         | 0        | 0       | NA         |
| Total           | 201      | 1,429 | 14.1%      | 8,754    | 174,046 | 5.0%       |

## Loss-Given-Default on Principal-Impaired Tranches and Historical Average Loss Rates

This section presents analysis of loss severity rates, also known as loss-given-default (LGD) rates, and combines information on loss severity rates with data on material impairment rates to derive cumulative loss rates. Estimating expected final LGD on impaired structured finance securities is particularly challenging because most securitizations are structured as pass-through securities and market prices are rarely available for structured securities in default. In previous research, we developed models to estimate final LGD for impaired tranches backed by residential mortgage collateral and for impaired collateralized bond obligations. In 2006, we developed a final LGD projection model for impaired manufactured housing ABS securities.<sup>7</sup> In this report we update all these projections and derive estimated aggregate loss rates by sector and by rating.

Moody's regularly updates the payment and loss records of impaired structured finance securities. For each tranche, we are able to calculate the present value of losses (to date) using the coupon rate as the discount rate. For many tranches, the loss rate to date is effectively the final loss severity because their balances have been written down to zero (called "resolved" impairments in this report). Many impaired tranches, however, have positive balances outstanding at the end of the study period and potential sources of future cash distributions to investors; hence, their expected final loss severity rates need to be estimated.

Although the majority of impaired structured securities are currently principal impaired, some are only experiencing interest shortfalls. Due to the higher probability of cure for interest-only impaired securities than principal impaired securities, and the greater challenge of forecasting losses for interest impaired tranches, in this report we will calculate and provide loss severity rates only for principal impairments.

### LGD for All Resolved Impairments

We first examine LGD for the 789 total impairments on which we have final, resolved impairment data. Recall that resolved impairments are defined as those impairments on which the principal balances were written down to zero and the final losses known by the end of 2007. We categorize the remaining 2,518 as "unresolved" impairments and deal with the estimation of LGD on those securities in subsequent sections. Exhibit 23 contains mean and median LGD, stratified by broad rating category, as well as for the broader investment grade and speculative grade categories.<sup>8</sup> Additionally, final LGD rates are computed by both original rating and rating at impairment, using the original balance and balance at impairment, respectively.

#### Exhibit 23: Realized Final LGD Rates by Rating for All Resolved Principal Impairments in the All Structured Finance Category, 1993-2007

| Rating            | Counts | Mean  | Median | Std Dev | Rating            | Counts | Mean  | Median | Std Dev |
|-------------------|--------|-------|--------|---------|-------------------|--------|-------|--------|---------|
| Aaa               | 8      | 2.7%  | 3.0%   | 1.0%    | Aaa               | 2      | 20.1% | 20.1%  | 0.0%    |
| Aa                | 25     | 37.4% | 16.8%  | 34.2%   | Aa                | 1      | 2.8%  | 2.8%   | NA      |
| A                 | 74     | 71.2% | 79.5%  | 29.2%   | A                 | 16     | 83.1% | 99.6%  | 34.1%   |
| Baa               | 350    | 66.2% | 77.7%  | 30.0%   | Baa               | 145    | 85.7% | 99.4%  | 29.3%   |
| Ba                | 242    | 71.8% | 86.3%  | 28.5%   | Ba                | 217    | 86.2% | 99.1%  | 27.0%   |
| B                 | 85     | 60.7% | 69.4%  | 25.5%   | B                 | 223    | 83.8% | 98.3%  | 28.9%   |
| Caa               | 5      | 75.5% | 75.2%  | 6.0%    | Caa               | 185    | 88.1% | 98.6%  | 24.1%   |
| Investment Grade  | 457    | 64.4% | 76.7%  | 31.7%   | Investment Grade  | 164    | 84.1% | 99.4%  | 31.0%   |
| Speculative Grade | 332    | 69.0% | 82.1%  | 28.0%   | Speculative Grade | 625    | 85.9% | 98.7%  | 26.9%   |
| All Ratings       | 789    | 66.3% | 79.2%  | 30.2%   | All Ratings       | 789    | 85.5% | 98.9%  | 27.8%   |

<sup>7</sup> See Moody's Special Comment, "Measuring Loss-Given-Default for Structured Finance Securities: An Update," December 2006.

<sup>8</sup> Compared to the 2006 Default and Loss Study, the number of realized final LGD rates for all resolved principal impairments in Exhibit 23 is based on a smaller sample. The reason for this is a stricter definition of what constitutes a "final" or resolved LGD rate in the 2007 study. Therefore, some impairments that were included in last year's study were excluded this year as they did not meet the new, stricter definition of a resolved impairment.

On average, the present value of losses at origination for all resolved principal impaired securities jumped to 66% this year, up from the 54% LGD rate reported in the 2006 study. Similarly, the LGD rate measured as the present value of losses as a percent of impairment-date balance is up to 86% from 73% last year. LGD rates are not monotonic in rating, and the differences between the investment grade LGD and speculative grade LGD rates are small, particularly when measured by rating at impairment. Nearly all measured LGD rates are skewed, with median LGD rates at impairment nearing 100% for all rating classes below Aa.

LGD rates vary much more widely across sectors than by rating class, and Exhibit 24 contains mean LGD rates for broad asset classes and some sub-asset classes. In virtually all cases, LGD rates for securities originally rated investment grade are lower than their speculative grade counterparts within the same sector (and even subsector).

### Exhibit 24: Realized Final LGD Rates by Sector for All Resolved Principal Impairments, 1993-2007

| Asset Class                                   | Counts | Mean  | Counts | Mean  |
|---|--------|-------|--------|-------|
| US ABS ex. HEL                                | 110    | 65.2% | 55     | 72.5% |
| ABS - Automobiles - Subprime                  | 1      | 12.7% | 1      | 2.0%  |
| ABS - Credit Card - Bank                      | 2      | 58.7% | 2      | 88.9% |
| ABS - Franchise Loans                         | 11     | 76.3% | 12     | 83.4% |
| ABS - Leases - Aircraft                       | 2      | 37.2% | 0      | NA    |
| ABS - Leases - Equipment                      | 0      | NA    | 2      | 13.4% |
| ABS - Manufactured Housing - Term             | 90     | 66.8% | 35     | 75.0% |
| ABS - Mutual Fund Fees                        | 4      | 29.6% | 3      | 51.3% |
| Global CDOs                                   | 29     | 36.4% | 11     | 51.5% |
| CDO - Emerging Markets                        | 1      | 32.8% | 0      | NA    |
| HY CBO  | 24     | 41.2% | 10     | 56.1% |
| HY CLO  | 4      | 8.8%  | 0      | NA    |
| SF CDO  | 0      | NA    | 1      | 5.7%  |
| US CMBS                                       | 5      | 33.0% | 34     | 61.5% |
| US RMBS/HEL                                   | 313    | 67.1% | 232    | 70.2% |
| Alt-A   | 2      | 33.6% | 8      | 53.2% |
| HELOC   | 3      | 91.6% | 6      | 91.3% |
| Jumbo   | 3      | 2.9%  | 5      | 39.3% |
| Subprime Firsts                               | 106    | 30.6% | 56     | 49.7% |
| Subprime Seconds                              | 189    | 91.2% | 124    | 88.7% |
| Scratch & Dent/Nonperforming/<br>Reperforming | 3      | 33.6% | 9      | 64.7% |
| Other   | 7      | 11.6% | 24     | 30.8% |

Compared to the previous study, US ABS ex. HEL and US CMBS LGD rates have remained quite stable, as have Global CDO LGDs. Given the jump in Global CDO impairments in 2007, this might be surprising, but we are considering only resolved principal impairments in the exhibit above, and principal balances on the recently-impaired securities likely have not fully been written down yet.

The US RMBS/HEL sector is further broken-out into sub-categories, and tranches backed by HELOCs and subprime seconds have fared particularly poorly. Indeed, LGD rates for both are near or above 90%, well

above the LGD rates for other US housing sub-sectors. There is generally significant differentiation between LGD rates for securities originally rated investment grade and securities originally rated speculative grade, with originally-rated investment grade securities experiencing lower LGD rates. The two exceptions are again the HELOC and subprime seconds categories, which experienced high LGD rates across all ratings.

## LGD for Principal Impaired RMBS/HEL Tranches

Exhibit 25 contains the estimated LGD rates for a combined sample of resolved and unresolved US RMBS and HEL securities that have experienced principal impairments. There are 831 principal impairments in this larger sample, up from 545 resolved principal impairments.

LGD rates remained low for securities originally rated Aaa and Aa, and originally speculative grade rated-securities suffered a 13% higher LGD rate than investment grade securities. LGD rates measured as a percent of the impairment-date balance are higher than LGD rates measured as a percent of original balance, owing mainly to discounting and principal amortization. Median impairment date-based LGD rates were above 90% for all ratings below Aa, and for the broader investment and speculative grade sectors as well.

### Exhibit 25: Estimated LGD Rates by Rating for a Combined Sample of Resolved and Unresolved RMBS/HEL Principal Impairments, 1993-2007

| Rating            | Counts | Mean  | Median | Std Dev | Rating            | Counts | Mean  | Median | Std Dev |
|-------------------|--------|-------|--------|---------|-------------------|--------|-------|--------|---------|
| Aaa               | 8      | 2.8%  | 3.2%   | 1.0%    | Aaa               | 0      | NA    | NA     | NA      |
| Aa                | 20     | 47.9% | 21.8%  | 39.8%   | Aa                | 2      | 29.7% | 29.7%  | 38.0%   |
| A                 | 87     | 73.2% | 90.9%  | 32.3%   | A                 | 19     | 70.9% | 99.6%  | 36.2%   |
| Baa               | 413    | 55.0% | 74.9%  | 37.3%   | Baa               | 141    | 80.0% | 99.5%  | 34.1%   |
| Ba                | 251    | 72.6% | 87.1%  | 27.9%   | Ba                | 225    | 83.9% | 99.0%  | 27.8%   |
| B                 | 52     | 54.2% | 64.4%  | 27.9%   | B                 | 244    | 80.1% | 98.0%  | 29.0%   |
| Caa               | 0      | NA    | NA     | NA      | Caa               | 200    | 74.4% | 93.4%  | 30.1%   |
| Investment Grade  | 528    | 56.9% | 84.6%  | 37.5%   | Investment Grade  | 162    | 78.3% | 99.5%  | 34.7%   |
| Speculative Grade | 303    | 69.4% | 85.1%  | 28.7%   | Speculative Grade | 669    | 79.7% | 98.1%  | 29.1%   |
| All Ratings       | 831    | 61.5% | 85.0%  | 35.1%   | All Ratings       | 831    | 79.4% | 98.6%  | 30.3%   |

## LGD for Principal Impaired CDO Tranches

Moody's developed and published a model to project final LGD rates for unresolved high-yield CBOs in 2005, and in this section, we apply this model to all unresolved principal impaired cash CDOs and append the forecasted LGD rates to the sample of resolved CDO LGD rate data, which includes resolved synthetics.<sup>9</sup> Exhibit 26 summarizes the results.

<sup>9</sup> See "Default & Loss Rates of U.S. CDOs: 1993-2003," Moody's Special Comment, March 2005. The model uses the weighted average rating factor (WARF) and the weighted average maturity (WAM), as reported by Moody's deal performance reports, to find the weighted average loss rates expected in the pool. These expected pool loss rates are used to adjust the 2006 year-end OC ratios, after taking into account the potential excess interest that would become available in the deal, if any excess exists. The adjusted OC ratios are then used to derive future payments available to the impaired tranches and compute the tranches' projected loss rates.

## Exhibit 26: Estimated LGD Rates by Rating for a Combined Sample of Resolved and Unresolved CDO Principal Impairments, 1993-2007

| Rating            | Counts | Mean  | Median | Std Dev | Rating            | Counts | Mean  | Median | Std Dev |
|-------------------|--------|-------|--------|---------|-------------------|--------|-------|--------|---------|
| Aaa               | 5      | 56.8% | 87.1%  | 49.3%   | Aaa               | 4      | 60.0% | 60.0%  | 46.2%   |
| Aa                | 17     | 53.3% | 72.8%  | 40.7%   | Aa                | 7      | 98.6% | 100.0% | 3.8%    |
| A                 | 21     | 80.8% | 92.8%  | 24.0%   | A                 | 16     | 97.9% | 100.0% | 4.3%    |
| Baa               | 141    | 60.3% | 68.0%  | 25.5%   | Baa               | 69     | 85.7% | 98.5%  | 22.2%   |
| Ba                | 55     | 59.4% | 68.8%  | 21.7%   | Ba                | 48     | 85.3% | 99.8%  | 25.6%   |
| B                 | 27     | 57.8% | 64.6%  | 23.5%   | B                 | 65     | 80.4% | 99.5%  | 31.0%   |
| Caa               | 0      | NA    | NA     | NA      | Caa               | 57     | 83.0% | 100.0% | 28.7%   |
| Investment Grade  | 184    | 61.9% | 68.9%  | 28.5%   | Investment Grade  | 96     | 87.6% | 100.0% | 22.0%   |
| Speculative Grade | 82     | 58.9% | 65.7%  | 22.2%   | Speculative Grade | 170    | 82.7% | 100.0% | 28.7%   |
| All Ratings       | 266    | 61.0% | 68.4%  | 26.7%   | All Ratings       | 266    | 84.4% | 100.0% | 26.6%   |

Average LGD rates by impairment date balance were generally much higher than their original balance counterparts, owing mainly to discounting and principal amortization. Loss severity at impairment was above 80% for all rating categories, excluding Aaa. As with other asset classes, median loss severities exceed mean loss severities, with median severities at impairment date balance at or near 100% for all categories except Aaa.

## LGD for Principal Impaired MH Tranches

Moody's introduced an LGD projection model for impaired ABS securities backed by manufactured housing (MH) loans in 2006, and Exhibit 27 contains descriptive LGD rate statistics computed using actual LGDs from resolved MH principal impairments and predicted LGDs from unresolved MH principal impairments.<sup>10</sup>

## Exhibit 27: Estimated LGD Rates by Rating for a Combined Sample of Resolved and Unresolved MH Principal Impairments, 1993-2007

| Rating            | Counts | Mean  | Median | Std Dev | Rating            | Counts | Mean  | Median | Std Dev |
|-------------------|--------|-------|--------|---------|-------------------|--------|-------|--------|---------|
| Aaa               | 0      | NA    | NA     | NA      | Aaa               | 0      | NA    | NA     | NA      |
| Aa                | 28     | 47.5% | 44.1%  | 15.4%   | Aa                | 3      | 78.7% | 86.6%  | 17.1%   |
| A                 | 34     | 63.7% | 66.0%  | 10.9%   | A                 | 12     | 66.6% | 60.2%  | 22.7%   |
| Baa               | 122    | 53.3% | 53.4%  | 21.4%   | Baa               | 45     | 83.3% | 95.2%  | 25.0%   |
| Ba                | 43     | 72.5% | 78.8%  | 17.6%   | Ba                | 69     | 85.6% | 95.3%  | 21.0%   |
| B                 | 2      | 80.6% | 80.6%  | 0.1%    | B                 | 54     | 77.7% | 84.9%  | 23.2%   |
| Caa               | 0      | NA    | NA     | NA      | Caa               | 46     | 85.7% | 85.4%  | 13.6%   |
| Investment Grade  | 184    | 54.3% | 56.2%  | 19.5%   | Investment Grade  | 60     | 79.7% | 91.8%  | 24.8%   |
| Speculative Grade | 45     | 72.9% | 79.7%  | 17.2%   | Speculative Grade | 169    | 83.1% | 92.2%  | 20.3%   |
| All Ratings       | 229    | 58.0% | 61.7%  | 20.5%   | All Ratings       | 229    | 82.2% | 92.2%  | 21.5%   |

<sup>10</sup> See Moody's Special Comment, "Measuring Loss-Given-Default for Structured Finance Securities: An Update," December 2006.

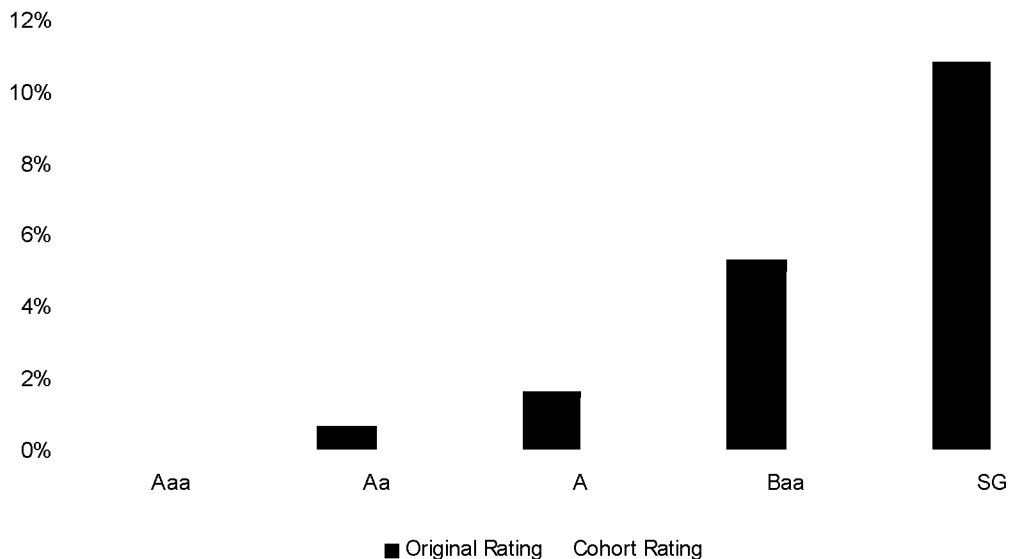
The average LGD rate, computed as a percent of original balance, for all MH principal impairments is 58%, with significant variation between the investment grade LGD rate of 54% and the speculative grade LGD rate of 73%. The MH LGD rate distribution is less skewed than the LGD rate distributions in other asset classes as the median and mean are close. Loss severity as a percent of impairment date balance is greater than original balance loss severity nearly across the board, with median severities at impairment date above 95% for Baa and Ba tranches.

## Historical Average Multi-Year Loss Rates

Multi-year cumulative loss rates are the weighted average of marginal loss rates, which we compute using marginal principal impairment and LGD rates. As in previous studies, we use sector specific LGD and impairment rates to calculate cumulative loss rates, except for the US CMBS sector, which again uses a combined sample of RMBS, HEL, and CMBS securities.<sup>11</sup> Loss rates in the all structured finance category, as in the 2006 study, use marginal impairment rates based on all impaired securities, rather than a weighted average of RMBS/HEL and CDOs, as was done prior to the 2006 study.

Exhibit 28 shows five-year cumulative loss rates by both original and cohort rating. Detailed multi-year cumulative loss rates by rating, horizon, and sector appear in Appendix 5.

### Exhibit 28: Structured Finance Five-Year Cumulative Loss Rates by Rating, 1993-2007



Although not visible in the above chart, Aaa-rated tranches, both by original rating and cohort rating, experience five-year cumulative loss rates of 3bp.

From Exhibit 28, we note the following:

Estimated cumulative loss rates increase as rating falls

Unlike in prior years' studies, five-year cumulative loss rates for securities originally rated A or Baa are higher than if measured by cohort rating.

Speculative-grade five-year cumulative loss rates are higher when measured by cohort rating as opposed to original rating. One of the main reasons is the momentum effect, which says that a downgraded security has a higher probability of being downgraded again and/or default than a security that has the same rating but has never been downgraded, and vice versa for upgrades.

<sup>11</sup> The US CMBS sector has low historical principal impairment rates, especially for longer horizons. As such, the US CMBS loss severity dataset is quite small. Therefore we have used loss severity data from other mortgage related sectors (e.g. US RMBS/HEL) as guidance to estimate US CMBS LGD rates.

## Appendix I: Description of Data Sample and Glossary

The data sample used in this report includes all public, 144A, and private tranches with a publishable Moody's long-term global debt rating among global asset-backed securities (ABS), commercial and residential mortgage-backed securities (CMBS and RMBS), collateralized debt obligations (CDOs), and other structured finance, including asset backed commercial paper (ABCP), structured investment vehicles (SIVs), structured covered bonds, catastrophe bonds, and derivative product companies. Provisional ratings, credit estimates or evaluations, short-term ratings, and national scale ratings are not included. The following types of securities are excluded from the definition of global structured finance and therefore are not included in the data sample: repackaged securities, structured notes, and other credit derivatives which are basically pass-throughs of the rating of another entity.

This data set is an expansion of the data set that was used in prior structured finance default and loss studies.<sup>12</sup> Unlike the data set from previous years, this data sample:

- Includes tranches wrapped by financial guarantors, government agencies, and government sponsored enterprises (GSEs);

- Includes interest-only (IO) and residual tranches;

- Includes some transactions outside of the four major sectors (ABS, CDO, CMBS, RMBS) of structured finance, such as ABCP, SIVs, structured covered bonds, catastrophe bonds and derivative product companies;

- Does not collapse tranches with the same rating from the same deal, i.e. all pari-passu tranches are counted in the data sample. The exceptions to this are notes with the same rating issued out of the same program for ABCP, SIVs and structured covered bonds, in which case only the rating of the program and not each individual security is counted.

*The data used to create this report are commercially available via Moody's Structured Finance Default Risk service and Moody's Corporate Default Risk service. For more information, please email [DefaultResearch@moodys.com](mailto:DefaultResearch@moodys.com).*

## Glossary

### Material Impairment

Structured finance securities are defined as being in material impairment if they have:

- Sustained a payment shortfall that remained uncured, or
- Been downgraded to Ca or C.

Prepayment-related and AFC-related interest shortfalls are not considered to be material impairments, but PIKing tranches are. Explicit principal write-downs are included whereas implicit principal write-downs or under-collateralizations are not.

The impairment status of a security may change as it goes from cured (i.e. all outstanding shortfalls and losses were repaid in full) to uncured (i.e. positive interest shortfalls or principal losses outstanding), or vice versa. If any securities rated Ca or C but not in payment shortfall are upgraded, they are considered to be no longer in material impairment. Securities rated Ca or C that were not upgraded are in material impairment even if their payment shortfalls have been cured. Finally, securities with very minor shortfalls or losses are excluded.

<sup>12</sup> The expanded data sample was first introduced in our 2007 rating transitions studies first that were published this year. The data sample in this study was extracted following similar guidelines.

## Payment Shortfall

Structured finance securities are defined as being in payment shortfall (previously called "payment default") if they have suffered either one of the following:

Interest shortfall

Principal write-down.

## Principal Impairment

This refers to materially impaired securities that have suffered principal write-downs or principal losses, or have been downgraded to Ca or C even though a principal write-down or loss has not yet been observed. In particular, if a security had experienced principal write-down/loss or was downgraded to Ca or C, it is called a principal impairment regardless of whether it had experienced interest shortfalls.

## Interest Impairment

This refers to materially impaired securities that have experienced only interest shortfalls, no principal losses, and were not downgraded to Ca or C.

## Investment-Grade (IG) Ratings

Investment-grade ratings refer to Aaa, Aa1, Aa2, Aa3, A1, A2, A3, Baa1, Baa2, and Baa3.

## Speculative-Grade (SG) Ratings

Below investment-grade or speculative-grade ratings refer to Ba1, Ba2, Ba3, B1, B2, B3, Caa1, Caa2, Caa3, Ca, and C.

## One-Year Impairment Rate

This is the number of securities that became newly impaired in a given year divided by the number of securities outstanding at the beginning of a year, minus one half the number of withdrawn ratings over the year.

## Trailing 12-Month Impairment Rate

This is the number of securities that became impaired within a 12-month period after a cohort formation date divided by the number of securities outstanding at the cohort formation date, minus one half the number of withdrawn ratings over the 12 months following cohort formation date. Cohorts are formed at the beginning of each month.

## Lifetime Impairment Rate

This is the total number of impaired securities divided by the total number of securities issued over a particular time period without regard to the time horizon of impairments.

## Marginal Impairment Rate

For a cohort of securities outstanding (or issued if by original rating) at the beginning of year  $t$ , the  $N$ -th year marginal impairment rate is the number of securities newly impaired in year  $(t+N)$  divided by the total number of securities that survived to that year. Securities that are impaired or withdrawn before the year have not survived, and therefore do not appear in the denominator of this rate.

## Multi-year Cumulative Impairment Rate

This is one minus the multi-year cumulative survival rate, which is the product of the marginal survival rates in each year within the multi-year horizon. The marginal survival rate is one minus the marginal impairment rate.



## Loss Severity or LGD

The LGD rate of an impaired structured finance security is measured by the sum of the present values of net losses, including both interest shortfalls and principal losses, discounted by the security's coupon rate and expressed as a percentage of a given principal balance such as the principal balance at origination, at the impairment date, or at any given cohort date.

## Resolved and Unresolved Impairments

A materially impaired security is "resolved" in the sense that its principal balance has been reduced to zero, or "unresolved" in the sense that it has a positive principal balance outstanding as of the end of the study period. These were called matured and non-matured defaults in prior studies.

## Multi-Year Cumulative Loss Rate

This is the product of the multi-year cumulative impairment rate and multi-year average LGD rate. The multi-year average LGD rate is estimated using the realized and estimated final LGD rates of impaired securities that have known loss severity rates, after taking into account the uncertainty of impairment timing.

## US ABS ex. HEL

ABS stands for asset-backed securities. This structured finance sector includes securities backed by asset types such as auto loans, credit card receivables, student loans, and manufactured housing loans, and non-traditional asset types such as mutual fund fees, tax liens, tobacco settlement payments, and intellectual property. Home equity loans (HEL) are no longer incorporated as part of US ABS.

## US HEL

The home equity loan or HEL sector includes securities backed by subprime (B&C) mortgage loans, home improvement loans, high loan-to-value (high LTV) loans, home equity lines of credit (HELOCs), and closed-end second-lien loans, as well as net interest margin (NIM) securitizations. It does not include securities backed by Alt-A mortgages, which are included in the RMBS sector. HEL is part of the ABS sector.

Prior to 1998, RMBS collateral was generally defined as first-lien residential mortgages, regardless of the credit quality of the borrower. HEL collateral generally included junior liens such as HELOCs or closed-end seconds. However, as subprime lending became more prevalent, the market shifted its definition such that HEL encompassed subprime first-lien residential mortgages while RMBS included first-lien mortgages made to higher quality borrowers. Since 1998, a deal classified as RMBS by Moody's is generally backed by prime or Alt-A quality first-lien residential mortgages, while a deal classified as HEL is generally backed by subprime first-lien mortgages or junior liens. Therefore, a subprime deal which would be classified as HEL today may have been classified as RMBS in the past.

## Global CDOs

CDOs stands for collateralized debt obligations. Derivative securities such as structured notes and repackaged securities are not considered to be part of this sector. Commercial real estate (CRE) CDOs, where 70% or more of the collateral is comprised of CRE loans, are classified as CMBS. If the collateral backing the transaction contains less than 70% CRE loans, then the deal is classified as a CDO. CDO types include:

- High yield collateralized loan obligations (HYCLO)
- Synthetic arbitrage CDOs (Syn Arb)
- Balance sheet cash flow CDOs (BalSh CF)
- Market value CDOs (MV)
- Balance sheet synthetic CDOs (BalSh Syn)
- Structured finance CDOs (SF CDO)
- High yield collateralized bond obligations (HYCBO)

## **US CMBS**

CMBS stands for commercial mortgage-backed securities. Commercial real estate (CRE) CDOs, where 70% or more of the collateral is comprised of CRE loans, are classified as CMBS. If the collateral backing the transaction contains less than 70% CRE loans, then the deal is classified as a CDO.

## **US RMBS**

RMBS stands for residential mortgage-backed securities. The vast majority of these securities are backed by first-lien prime mortgages or by Alt-A mortgages.

## **Other Structured Finance**

Other structured finance consists of structured finance securities not categorized in the five major sectors (ABS, HEL, CDO, CMBS, and RMBS) including asset-backed commercial paper (ABCP) programs, structured investment vehicles (SIVs), structured covered bonds, insurance-linked securities such as catastrophe bonds, and derivative product companies. However, notes carrying only short-term ratings such as commercial paper are excluded.

## **Global Structured Finance**

Global structured finance captures securities issued around the world in the five major sectors - ABS, HEL, CDO, CMBS, and RMBS – and in the other structured finance category.

## **EMEA SF ex. CDO and Other SF**

EMEA is an abbreviation of Europe, the Middle East, and Africa. EMEA structured finance securities are denominated in a currency from or issued out of a country in the EMEA region. In cases where the source of the underlying collateral and the denomination of the securities cross multiple countries/regions, deals are classified by the location at which they are monitored. CDOs and Other SF are excluded.

## **U.S. Structured Finance**

U.S. structured finance securities are denominated in U.S. dollars and issued in the U.S. market or denominated in Canadian dollars and issued in Canada. In cases where the source of the underlying collateral and the denomination of the securities crossed multiple countries/regions, deals are classified by the location at which they are monitored.

## **Intl SF ex. CDO and Other SF**

This refers to securities that are not denominated in U.S. dollars and issued in the U.S. market and not denominated in Canadian dollars and issued in Canada. The majority of the securities in this sector are issued in Europe, the Middle East, and Africa (EMEA); the rest are issued in the Asia Pacific region and Latin America. CDOs and Other SF are excluded.

## **Other Intl SF ex. CDO and Other SF**

This refers to securities that are not denominated in U.S. dollars, Canadian dollars, or any currency in the EMEA region, and are not issued out of the U.S., Canada, or any country in the EMEA region. Regions covered include Asia Pacific and Latin America. CDOs and Other SF are excluded.

## Appendix II: How to Calculate Multi-Year Material Impairment Rate and LGD Rate

### Cumulative Impairment Rate by Cohort Rating

The methodology for computing multi-year cumulative impairment rate for structured finance securities is the same as the one used in Moody's corporate issuer default studies. The denominator of the marginal impairment rate in a given period (e.g. one year) is adjusted to reflect tranches whose ratings were withdrawn or impaired prior to that period. Such an adjustment implies that future impairments can only occur to tranches that have survived to that point in time and cannot occur to tranches that have already been impaired or withdrawn. Rating cohorts are formed each month to construct cumulative impairment rates.

The cumulative impairment rate for a time horizon  $T$  is calculated as:

$$D(T) = 1 - \prod_{t=1}^T (1 - d_t)$$

Where  $d_t$  ( $t$  is subscript) is the marginal rate:

$$d_t = \frac{x_t}{n_t - w_t / 2}$$

And where  $x_t$  is the number of impairments in year  $t$ ,  $w_t$  is the number of rating withdrawals in year  $t$ , and

$$n_t = n_{t-1} - x_{t-1} - w_{t-1}$$

The variable  $n_t$  is the number of tranches that survive into the cohort at time  $t$ . When the horizon  $T$  is equal to 1, the cumulative impairment rate and the marginal impairment rate are equal. Note that in addition to removing the prior-year withdrawals from the denominator, one-half of the withdrawals in time  $t$  are also removed. This adjustment accounts for the fact that the withdrawn securities were likely not outstanding for the entire time period and assumes that the timing of withdrawals within a given period are uniformly distributed.

Let us now look at an example, assuming all securities are carrying the same rating in both 2004 and 2005.

#### **An Example for Calculating Cumulative Impairment Rates**

| Number of Securities Issued | Impaired | Withdrawn | Number of Securities Outstanding | Impaired | Withdrawn |
|-----------------------------|----------|-----------|----------------------------------|----------|-----------|
| 200                         | 10       | 95        | 95                               | 5        | 90        |

In the example, the average first-year marginal impairment rate is  $(10+5)/(200+95-95/2-90/2)$ , or 7.41%. The second-year marginal impairment rate is  $5/(95-90/2)=10\%$ .<sup>13</sup> The average marginal survival rates are 92.6% and 90.0% in the first and second year, respectively. The average two-year cumulative survival rate is the product of the two survival rates:  $92.6\%*90.0\%=83.3\%$ . Therefore, the average two-year cumulative impairment rate is  $1-\text{survival rate}$  ( $100\%-83.3\%$ ) = 16.7%.

Moody's believes that this method of calculating cumulative impairment rates provides the most relevant information to investors who want to look at the historical impairment experience when evaluating the risk of an investment with any particular expected maturity. There are, however, at least two other approaches found in the literature, which tend to produce lower impairment rates and/or fail to use all available information.

One similar approach calculates the marginal impairment rates without adjusting for withdrawals, hence,  $n_t = n_{t-1} - x_{t-1}$ . Applying this methodology to the above example reduces the second year marginal impairment rate to  $5/(95+95-90/2) = 3.45\%$ . The average two-year cumulative impairment rate then becomes  $(1-7.41\%)*(1-3.45\%) = 10.6\%$ . Not adjusting for withdrawals inflates the survival rate and thus, lowers the cumulative impairment rate.

Another approach calculates cumulative impairment rates by treating impairment as a separate "rating" category (note that Moody's does not have a "D" or default rating category). For a given time horizon, ratings transition frequencies are calculated using only ratings observations at the beginning and the end of the time horizon. Newly issued ratings that have not spanned the entire time horizon are not included. For example, if additional securities are issued at the beginning of 2005, the impairment experience of those securities would not be included in a two-year impairment rate calculation. Therefore, this methodology is limited, for it does not fully utilize all available, relevant data.

## Cumulative Impairment by Original Rating

As in previous structured finance default studies, we calculate impairment rates for both cohort and original ratings using essentially the same method. On the whole, cumulative impairment rates by original rating have been lower on average than those by cohort rating for structured finance. We also caution that the comparison and interpretation of the impairment rates by these two types of ratings are different depending on sector and sample period. The following example illustrates the contrast.

### *An Example Showing the Difference between Cohort-Based Impairment Rates and Origination-Based Impairment Rates*

| Number of Securities Issued and Their Rating | Impaired | Withdrawn | Distribution of Outstanding Securities by Rating                 | Impaired | Withdrawn |
|--|----------|-----------|--|----------|-----------|
| 100, rated <b>Baa</b>                        | 0        | 0         | 95, remain <b>Baa</b> rated;<br>5, downgraded to <b>single-B</b> | 0        | 95        |
| 100, rated <b>single-B</b>                   | 0        | 0         | 100, remain <b>single-B</b>                                      | 5        | 95        |

In the example, 100 Baa-rated and 100 single-B rated securities are issued at the beginning of 2004. At the end of 2005, 95 of the 100 Baa-rated securities have not changed their ratings and are withdrawn, and five securities are downgraded to single-B in 2004 before they become impaired in 2005. Five of the 100 single-B rated securities issued in 2004 become impaired in 2005 and the rest (95 securities) are withdrawn in 2005.

<sup>13</sup> There are two first-year cohorts in this example – one formed at the beginning of 2004 and the other formed at the beginning of 2005. However, there is only one second-year cohort – the observations in 2005 of the two-year cohort that is formed at the beginning of 2004.

Based on cohort ratings, the first-year marginal impairment rate in the Baa category is 0% since no impairments are observed on securities rated Baa in 2004 or 2005. The second year marginal impairment rate for Baa is  $5/(100-95/2)=9.5\%$ . (This statistic is based solely on the performance in 2005 of the 100 Baa-rated securities issued in 2004). Hence, the two-year cumulative impairment rate in the Baa rating category is 9.5%.

By original rating, the two-year cumulative impairment rate for the Baa rating category is also  $5/(100-95/2)=9.5\%$ . The Baa sample and performance are the same by original rating or cohort rating. In the single-B category, however, there are significant differences.

For the single-B rating category, the average first-year marginal impairment rate by cohort rating is  $(0+5+5)/(100+100+5-95/2)=6.35\%$ . Note that there are three first-year cohorts for single-B, and both the numerator and denominator include the five single-B securities, which were initially rated Baa at the beginning of 2004. The second-year marginal impairment rate by cohort rating is  $5/(100-95/2)=9.5\%$ . Therefore, the average two-year cumulative impairment rate is  $1-(1-6.35\%)*(1-9.5\%)=15.25\%$ .

However, by original rating, the first-year single-B marginal impairment rate is 0% because there are no impairments in 2004. The second-year marginal impairment rate is 9.5%, which is the same rate as that by cohort rating. This implies that the two-year cumulative impairment rate by original rating for single-B is 9.5%, which is substantially lower than the cumulative impairment rate of 15.25% by cohort rating.

The large difference between the single-B two-year impairment rates by original rating and cohort rating is due to the treatment of the five securities initially rated Baa at the beginning of 2004 but downgraded to single-B at the beginning of 2005. If the performance of these downgraded single-B's is worse than the original single-B's, then the cohort-rating based impairment rates will be higher than the original-rating based impairment rates. Conversely, if the performance of these downgraded single-B's is better, the cohort-rating based impairment rates will be lower instead.

## Multi-Year Cumulative LGD Rates

When loss severity rates on all impaired securities are not available, direct calculation of the cumulative loss rate is not possible. In these cases, we rely on the concept of multi-year cumulative LGD rate, which is a weighted average of marginal loss severity rates. Suppose that we know the average loss severity as a percentage of the cohort-date balance (also known as "marginal loss severity rates") of single-B rated securities both one and two years before they default. The average loss severity rates of the single-B rated securities that default within two years (either in year 1 or year 2) is calculated by taking the weighted average of the one-year and two-year marginal severity rates. The weights are attributable to each year and are shares of the two-year cumulative default rates. The following is a concrete example:

### *An Example for Calculating a Two-Year Cumulative LGD Rate*

| Number of Securities Issued | Impaired    | Withdrawn | Number of Outstanding Securities | Impaired    | Withdrawn |
|-----------------------------|-------------|-----------|----------------------------------|-------------|-----------|
| 100                         | 5 (LGD=30%) | 0         | 95                               | 6 (LGD=50%) | 89        |

In this example, there are five impairments in the first year, and all have a loss severity rate of 30% as a share of their balance at the beginning of 2004. Six securities are impaired in the second year, and all have a loss severity rate of 50%, which is expressed as a share of the principal balance at the beginning of 2004 – the two-year cohort-date balance. Note that in order to compute a two-year cumulative LGD rate, all marginal LGD rates need to be expressed as a share of the cohort-date balance with appropriate discounting.

In the example, the one-year impairment rate is 5%, and the two-year cumulative impairment rate is  $1-(1-5\%)*(1-6/(95-89/2))$ , or 16.3%. The two-year cumulative LGD rate is:  $(5\%*30\%+11.3\%*50\%)/16.3\%=43.9\%$ , which measures the average LGD rate over a two-year period, assuming no knowledge about the timing of impairments at the beginning of 2004.

Thus, the two-year cumulative loss rate is the product of the two-year cumulative impairment rate and the two-year cumulative LGD rate, i.e.  $16.3\% \times 43.9\% = 7.2\%$ .

Finally, our estimated average multi-year LGD rates can be directly computed from the tables in Appendices IV and V by simply dividing the estimated multi-year loss rates by the multi-year impairment rates. Please note that the number of impaired securities at long horizons (such as six and seven years) for most asset classes is very small, and therefore the average LGD rates are not stable.

## Appendix III: Material Impairment Rates

| <b>Global Structured Finance</b> | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
|----------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Aaa                              | 0.01%         | 0.02%         | 0.07%         | 0.12%         | 0.17%         | 0.19%         | 0.20%         |
| Aa                               | 0.14%         | 0.38%         | 0.74%         | 1.22%         | 1.69%         | 2.00%         | 2.26%         |
| A                                | 0.23%         | 0.64%         | 1.18%         | 1.79%         | 2.47%         | 3.20%         | 3.69%         |
| Baa                              | 1.11%         | 2.78%         | 5.09%         | 7.47%         | 10.32%        | 12.85%        | 15.39%        |
| Ba                               | 3.22%         | 6.54%         | 9.94%         | 13.54%        | 15.82%        | 17.88%        | 19.42%        |
| B                                | 5.05%         | 9.74%         | 14.57%        | 18.89%        | 23.24%        | 26.34%        | 28.62%        |
| Caa                              | 19.86%        | 30.73%        | 39.57%        | 50.02%        | 56.34%        | 59.60%        | 59.60%        |
| Investment Grade                 | 0.19%         | 0.50%         | 0.93%         | 1.40%         | 1.91%         | 2.34%         | 2.73%         |
| Speculative Grade                | 4.76%         | 8.94%         | 13.07%        | 17.17%        | 20.23%        | 22.64%        | 24.38%        |
| All Ratings                      | 0.50%         | 1.08%         | 1.78%         | 2.51%         | 3.20%         | 3.76%         | 4.23%         |
| <b>US ABS, excluding HEL</b>     | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa                              | 0.03%         | 0.06%         | 0.20%         | 0.38%         | 0.53%         | 0.59%         | 0.65%         |
| Aa                               | 0.94%         | 2.49%         | 4.20%         | 6.16%         | 8.04%         | 9.08%         | 9.74%         |
| A                                | 0.35%         | 1.22%         | 2.37%         | 3.55%         | 4.88%         | 6.01%         | 6.59%         |
| Baa                              | 1.78%         | 4.92%         | 9.18%         | 13.46%        | 20.91%        | 28.94%        | 35.94%        |
| Ba                               | 10.48%        | 23.55%        | 35.66%        | 55.44%        | 64.12%        | 70.95%        | 74.99%        |
| B                                | 15.63%        | 26.57%        | 37.03%        | 44.88%        | 55.97%        | 59.39%        | 59.39%        |
| Caa                              | 32.36%        | 49.91%        | 64.48%        | 91.77%        | 91.77%        | NA            | NA            |
| Investment Grade                 | 0.33%         | 0.97%         | 1.87%         | 2.84%         | 4.13%         | 5.36%         | 6.41%         |
| Speculative Grade                | 15.02%        | 28.19%        | 40.11%        | 57.58%        | 65.90%        | 71.46%        | 74.27%        |
| All Ratings                      | 0.92%         | 2.05%         | 3.31%         | 4.68%         | 6.12%         | 7.44%         | 8.52%         |
| <b>US HEL</b>                    | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa                              | 0.01%         | 0.05%         | 0.12%         | 0.23%         | 0.27%         | 0.29%         | 0.29%         |
| Aa                               | 0.03%         | 0.07%         | 0.27%         | 0.54%         | 0.59%         | 0.59%         | 0.59%         |
| A                                | 0.26%         | 0.54%         | 0.94%         | 1.42%         | 1.94%         | 2.98%         | 4.55%         |
| Baa                              | 1.68%         | 3.81%         | 7.69%         | 13.31%        | 18.97%        | 22.03%        | 24.58%        |
| Ba                               | 8.93%         | 15.46%        | 22.61%        | 28.31%        | 32.43%        | 35.20%        | 38.29%        |
| B                                | 21.77%        | 37.24%        | 50.17%        | 57.68%        | 63.30%        | 65.86%        | 68.39%        |
| Caa                              | 34.86%        | 41.91%        | 45.39%        | 49.68%        | 54.15%        | 59.24%        | 59.24%        |
| Investment Grade                 | 0.33%         | 0.74%         | 1.41%         | 2.23%         | 2.91%         | 3.31%         | 3.69%         |
| Speculative Grade                | 11.69%        | 20.02%        | 28.67%        | 35.11%        | 39.98%        | 42.94%        | 45.93%        |
| All Ratings                      | 0.79%         | 1.49%         | 2.45%         | 3.49%         | 4.34%         | 4.86%         | 5.35%         |

| <b>US RMBS</b>     | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
|--------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Aaa                | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| Aa                 | 0.01%         | 0.04%         | 0.06%         | 0.09%         | 0.10%         | 0.10%         | 0.10%         |
| A                  | 0.09%         | 0.22%         | 0.35%         | 0.55%         | 0.70%         | 0.73%         | 0.73%         |
| Baa                | 0.31%         | 0.68%         | 1.21%         | 1.74%         | 2.20%         | 2.68%         | 3.17%         |
| Ba                 | 0.77%         | 1.76%         | 2.89%         | 3.95%         | 4.80%         | 5.74%         | 6.20%         |
| B                  | 1.92%         | 3.90%         | 5.78%         | 7.29%         | 8.40%         | 8.83%         | 9.25%         |
| Caa                | 40.91%        | 40.91%        | 40.91%        | 40.91%        | 40.91%        | 40.91%        | 40.91%        |
| Investment Grade   | 0.03%         | 0.06%         | 0.10%         | 0.16%         | 0.20%         | 0.24%         | 0.27%         |
| Speculative Grade  | 1.25%         | 2.60%         | 3.99%         | 5.19%         | 6.12%         | 6.90%         | 7.34%         |
| All Ratings        | 0.07%         | 0.17%         | 0.28%         | 0.39%         | 0.48%         | 0.55%         | 0.61%         |
| <b>US CMBS</b>     | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa                | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| Aa                 | 0.04%         | 0.10%         | 0.10%         | 0.10%         | 0.10%         | 0.10%         | 0.10%         |
| A                  | 0.02%         | 0.09%         | 0.17%         | 0.17%         | 0.27%         | 0.55%         | 0.55%         |
| Baa                | 0.25%         | 0.69%         | 0.87%         | 0.94%         | 1.25%         | 1.36%         | 2.58%         |
| Ba                 | 0.27%         | 0.76%         | 2.00%         | 3.70%         | 5.36%         | 7.64%         | 8.87%         |
| B                  | 1.53%         | 3.93%         | 7.58%         | 12.01%        | 17.03%        | 22.07%        | 26.51%        |
| Caa                | 14.66%        | 26.09%        | 35.30%        | 44.06%        | 51.09%        | 55.02%        | 55.02%        |
| Investment Grade   | 0.07%         | 0.20%         | 0.26%         | 0.28%         | 0.37%         | 0.45%         | 0.77%         |
| Speculative Grade  | 1.56%         | 3.45%         | 6.14%         | 9.39%         | 12.83%        | 16.45%        | 19.09%        |
| All Ratings        | 0.40%         | 0.93%         | 1.60%         | 2.36%         | 3.20%         | 4.03%         | 4.81%         |
| <b>Global CDOs</b> | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa                | 0.03%         | 0.04%         | 0.05%         | 0.07%         | 0.11%         | 0.18%         | 0.35%         |
| Aa                 | 0.09%         | 0.20%         | 0.58%         | 1.36%         | 2.63%         | 4.34%         | 6.60%         |
| A                  | 0.37%         | 0.92%         | 1.53%         | 2.42%         | 3.31%         | 5.36%         | 7.73%         |
| Baa                | 1.83%         | 4.87%         | 8.54%         | 11.51%        | 14.36%        | 16.52%        | 18.51%        |
| Ba                 | 2.67%         | 6.26%         | 10.06%        | 13.11%        | 14.94%        | 16.34%        | 20.19%        |
| B                  | 9.95%         | 19.54%        | 27.57%        | 33.87%        | 40.59%        | 44.03%        | 44.03%        |
| Caa                | 14.66%        | 22.12%        | 28.57%        | 39.11%        | 54.79%        | 54.79%        | 54.79%        |
| Investment Grade   | 0.52%         | 1.40%         | 2.54%         | 3.65%         | 4.86%         | 6.15%         | 7.65%         |
| Speculative Grade  | 5.08%         | 10.15%        | 14.98%        | 19.07%        | 22.08%        | 23.85%        | 26.73%        |
| All Ratings        | 1.16%         | 2.67%         | 4.40%         | 6.00%         | 7.49%         | 8.85%         | 10.48%        |



| <b>Global Structured Finance</b> | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
|----------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Aaa                              | 0.06%         | 0.08%         | 0.10%         | 0.14%         | 0.26%         | 0.27%         | 0.30%         |
| Aa                               | 0.25%         | 0.53%         | 0.63%         | 1.01%         | 1.65%         | 2.14%         | 2.52%         |
| A                                | 0.79%         | 1.62%         | 1.99%         | 2.50%         | 3.17%         | 3.94%         | 4.61%         |
| Baa                              | 2.58%         | 5.77%         | 7.18%         | 9.35%         | 12.51%        | 15.97%        | 17.68%        |
| Ba                               | 4.91%         | 13.17%        | 16.07%        | 18.97%        | 21.57%        | 22.94%        | 24.61%        |
| B                                | 0.27%         | 1.91%         | 6.28%         | 10.48%        | 14.53%        | 18.85%        | 21.77%        |
| Caa                              | 0.82%         | 0.82%         | 3.13%         | 10.05%        | 22.04%        | 38.45%        | 38.45%        |
| Investment Grade                 | 0.54%         | 1.15%         | 1.42%         | 1.90%         | 2.59%         | 3.25%         | 3.65%         |
| Speculative Grade                | 3.76%         | 10.36%        | 13.61%        | 16.89%        | 19.99%        | 22.44%        | 24.45%        |
| All Ratings                      | 0.73%         | 1.71%         | 2.18%         | 2.85%         | 3.72%         | 4.53%         | 5.06%         |
| <b>US ABS, excluding HEL</b>     | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa                              | 0.08%         | 0.12%         | 0.15%         | 0.33%         | 0.71%         | 0.71%         | 0.83%         |
| Aa                               | 0.88%         | 1.95%         | 3.06%         | 5.01%         | 8.73%         | 11.65%        | 12.49%        |
| A                                | 0.08%         | 0.37%         | 1.16%         | 2.45%         | 3.81%         | 5.35%         | 6.32%         |
| Baa                              | 0.16%         | 1.51%         | 5.50%         | 9.34%         | 14.18%        | 21.30%        | 29.35%        |
| Ba                               | 2.06%         | 12.63%        | 25.71%        | 35.61%        | 45.19%        | 53.85%        | 66.52%        |
| B                                | 0.00%         | 8.22%         | 36.46%        | 36.46%        | 42.51%        | 42.51%        | 42.51%        |
| Caa                              | 66.67%        | 66.67%        | NA            | NA            | NA            | NA            | NA            |
| Investment Grade                 | 0.14%         | 0.41%         | 1.01%         | 1.90%         | 3.19%         | 4.49%         | 5.66%         |
| Speculative Grade                | 2.10%         | 12.26%        | 27.48%        | 35.86%        | 44.89%        | 52.24%        | 63.20%        |
| All Ratings                      | 0.18%         | 0.64%         | 1.50%         | 2.54%         | 3.98%         | 5.39%         | 6.77%         |
| <b>US HEL</b>                    | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa                              | 0.00%         | 0.00%         | 0.00%         | 0.07%         | 0.32%         | 0.36%         | 0.36%         |
| Aa                               | 0.07%         | 0.48%         | 0.48%         | 1.03%         | 1.18%         | 1.18%         | 1.18%         |
| A                                | 0.67%         | 2.47%         | 2.58%         | 2.77%         | 3.15%         | 3.39%         | 5.13%         |
| Baa                              | 4.94%         | 11.22%        | 11.97%        | 14.99%        | 22.05%        | 29.97%        | 31.00%        |
| Ba                               | 15.42%        | 40.60%        | 45.08%        | 50.55%        | 55.73%        | 57.87%        | 59.95%        |
| B                                | 1.29%         | 8.29%         | 34.03%        | 53.73%        | 57.66%        | 68.52%        | 68.52%        |
| Caa                              | 0.00%         | 0.00%         | NA            | NA            | NA            | NA            | NA            |
| Investment Grade                 | 1.08%         | 2.69%         | 2.87%         | 3.69%         | 5.24%         | 6.44%         | 6.73%         |
| Speculative Grade                | 14.69%        | 38.79%        | 44.44%        | 51.32%        | 56.21%        | 60.51%        | 62.00%        |
| All Ratings                      | 1.76%         | 4.48%         | 5.02%         | 6.14%         | 7.80%         | 9.14%         | 9.50%         |

| <b>US RMBS</b>     | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
|--------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Aaa                | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| Aa                 | 0.00%         | 0.00%         | 0.00%         | 0.05%         | 0.12%         | 0.12%         | 0.12%         |
| A                  | 0.00%         | 0.04%         | 0.23%         | 0.34%         | 0.51%         | 0.98%         | 0.98%         |
| Baa                | 0.29%         | 2.39%         | 2.56%         | 3.17%         | 3.48%         | 3.91%         | 4.20%         |
| Ba                 | 0.31%         | 3.46%         | 4.34%         | 5.96%         | 6.23%         | 7.65%         | 8.63%         |
| B                  | 0.21%         | 1.66%         | 3.81%         | 5.98%         | 8.45%         | 10.67%        | 11.79%        |
| Caa                | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| Investment Grade   | 0.02%         | 0.17%         | 0.19%         | 0.25%         | 0.29%         | 0.35%         | 0.37%         |
| Speculative Grade  | 0.28%         | 2.87%         | 4.19%         | 6.01%         | 7.06%         | 8.73%         | 9.75%         |
| All Ratings        | 0.03%         | 0.26%         | 0.34%         | 0.48%         | 0.58%         | 0.74%         | 0.82%         |
| <b>US CMBS</b>     | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa                | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| Aa                 | 0.00%         | 0.18%         | 0.18%         | 0.18%         | 0.18%         | 0.18%         | 0.18%         |
| A                  | 0.00%         | 0.00%         | 0.23%         | 0.23%         | 0.23%         | 1.04%         | 1.04%         |
| Baa                | 0.04%         | 0.32%         | 0.72%         | 0.83%         | 1.14%         | 1.14%         | 1.14%         |
| Ba                 | 0.08%         | 0.18%         | 0.57%         | 1.23%         | 2.43%         | 2.43%         | 3.71%         |
| B                  | 0.20%         | 0.57%         | 1.50%         | 4.20%         | 8.85%         | 11.70%        | 16.33%        |
| Caa                | 0.00%         | 0.00%         | 3.51%         | 11.23%        | 23.91%        | 41.81%        | 41.81%        |
| Investment Grade   | 0.01%         | 0.11%         | 0.25%         | 0.28%         | 0.36%         | 0.52%         | 0.52%         |
| Speculative Grade  | 0.13%         | 0.34%         | 1.04%         | 2.78%         | 5.88%         | 7.83%         | 10.63%        |
| All Ratings        | 0.04%         | 0.16%         | 0.43%         | 0.87%         | 1.68%         | 2.28%         | 2.93%         |
| <b>Global CDOs</b> | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa                | 0.67%         | 0.84%         | 0.92%         | 0.92%         | 0.92%         | 0.92%         | 0.92%         |
| Aa                 | 1.03%         | 1.41%         | 1.47%         | 1.68%         | 2.27%         | 2.83%         | 5.03%         |
| A                  | 3.20%         | 4.62%         | 5.35%         | 6.07%         | 7.06%         | 7.38%         | 8.62%         |
| Baa                | 4.69%         | 7.57%         | 11.48%        | 15.02%        | 18.03%        | 21.37%        | 22.55%        |
| Ba                 | 4.05%         | 8.51%         | 11.96%        | 15.71%        | 19.39%        | 20.19%        | 20.19%        |
| B                  | 0.82%         | 8.34%         | 25.52%        | 38.71%        | 43.30%        | 55.67%        | 55.67%        |
| Caa                | 0.00%         | 0.00%         | 0.00%         | 0.00%         | NA            | NA            | NA            |
| Investment Grade   | 2.10%         | 3.16%         | 4.29%         | 5.37%         | 6.45%         | 7.56%         | 8.54%         |
| Speculative Grade  | 3.78%         | 8.51%         | 13.28%        | 18.12%        | 21.96%        | 24.69%        | 24.69%        |
| All Ratings        | 2.26%         | 3.69%         | 5.20%         | 6.72%         | 8.15%         | 9.49%         | 10.33%        |

## Appendix IV: Principal Impairment Rates

| <b>Global Structured Finance</b> | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
|----------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Aaa                              | 0.01%         | 0.02%         | 0.06%         | 0.12%         | 0.16%         | 0.16%         | 0.16%         |
| Aa                               | 0.12%         | 0.35%         | 0.68%         | 1.11%         | 1.55%         | 1.85%         | 2.11%         |
| A                                | 0.20%         | 0.59%         | 1.07%         | 1.61%         | 2.17%         | 2.76%         | 3.12%         |
| Baa                              | 1.04%         | 2.60%         | 4.80%         | 7.05%         | 9.76%         | 12.15%        | 14.62%        |
| Ba                               | 3.13%         | 6.36%         | 9.64%         | 13.03%        | 15.11%        | 17.07%        | 18.54%        |
| B                                | 4.84%         | 9.25%         | 13.74%        | 17.78%        | 21.82%        | 24.67%        | 26.89%        |
| Caa                              | 17.40%        | 26.63%        | 34.47%        | 44.63%        | 51.23%        | 54.87%        | 54.87%        |
| Investment Grade                 | 0.18%         | 0.47%         | 0.87%         | 1.31%         | 1.78%         | 2.17%         | 2.53%         |
| Speculative Grade                | 4.52%         | 8.48%         | 12.37%        | 16.22%        | 19.05%        | 21.32%        | 23.00%        |
| All Ratings                      | 0.47%         | 1.02%         | 1.68%         | 2.36%         | 2.99%         | 3.50%         | 3.95%         |
| <b>US ABS, excluding HEL</b>     | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa                              | 0.03%         | 0.06%         | 0.20%         | 0.36%         | 0.48%         | 0.48%         | 0.48%         |
| Aa                               | 0.88%         | 2.34%         | 3.88%         | 5.61%         | 7.30%         | 8.25%         | 8.89%         |
| A                                | 0.33%         | 1.17%         | 2.20%         | 3.17%         | 4.18%         | 4.96%         | 5.21%         |
| Baa                              | 1.70%         | 4.67%         | 8.70%         | 12.63%        | 19.67%        | 27.19%        | 34.07%        |
| Ba                               | 10.14%        | 22.64%        | 34.42%        | 53.28%        | 61.21%        | 67.79%        | 72.16%        |
| B                                | 14.28%        | 23.74%        | 31.30%        | 36.11%        | 45.32%        | 49.55%        | 49.55%        |
| Caa                              | 25.53%        | 38.21%        | 50.15%        | 81.46%        | 81.46%        | NA            | NA            |
| Investment Grade                 | 0.32%         | 0.92%         | 1.76%         | 2.62%         | 3.77%         | 4.82%         | 5.76%         |
| Speculative Grade                | 13.60%        | 25.38%        | 36.16%        | 52.84%        | 60.56%        | 66.39%        | 69.64%        |
| All Ratings                      | 0.86%         | 1.90%         | 3.07%         | 4.31%         | 5.58%         | 6.73%         | 7.70%         |
| <b>US HEL</b>                    | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa                              | 0.01%         | 0.05%         | 0.12%         | 0.23%         | 0.27%         | 0.29%         | 0.29%         |
| Aa                               | 0.03%         | 0.07%         | 0.27%         | 0.54%         | 0.59%         | 0.59%         | 0.59%         |
| A                                | 0.26%         | 0.54%         | 0.94%         | 1.42%         | 1.94%         | 2.98%         | 4.55%         |
| Baa                              | 1.67%         | 3.79%         | 7.64%         | 13.27%        | 18.93%        | 21.99%        | 24.54%        |
| Ba                               | 8.93%         | 15.46%        | 22.61%        | 28.31%        | 32.43%        | 35.20%        | 38.29%        |
| B                                | 21.74%        | 37.22%        | 50.15%        | 57.67%        | 63.29%        | 65.85%        | 68.38%        |
| Caa                              | 34.86%        | 41.91%        | 45.39%        | 49.68%        | 54.15%        | 59.24%        | 59.24%        |
| Investment Grade                 | 0.33%         | 0.73%         | 1.41%         | 2.23%         | 2.90%         | 3.30%         | 3.68%         |
| Speculative Grade                | 11.69%        | 20.02%        | 28.67%        | 35.11%        | 39.98%        | 42.94%        | 45.93%        |
| All Ratings                      | 0.79%         | 1.49%         | 2.44%         | 3.48%         | 4.33%         | 4.85%         | 5.35%         |

| <b>US RMBS</b>     | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
|--------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Aaa                | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| Aa                 | 0.01%         | 0.04%         | 0.06%         | 0.09%         | 0.10%         | 0.10%         | 0.10%         |
| A                  | 0.09%         | 0.22%         | 0.35%         | 0.55%         | 0.70%         | 0.73%         | 0.73%         |
| Baa                | 0.31%         | 0.68%         | 1.21%         | 1.74%         | 2.20%         | 2.68%         | 3.17%         |
| Ba                 | 0.77%         | 1.76%         | 2.89%         | 3.95%         | 4.80%         | 5.74%         | 6.20%         |
| B                  | 1.92%         | 3.90%         | 5.78%         | 7.29%         | 8.40%         | 8.83%         | 9.25%         |
| Caa                | 40.91%        | 40.91%        | 40.91%        | 40.91%        | 40.91%        | 40.91%        | 40.91%        |
| Investment Grade   | 0.03%         | 0.06%         | 0.10%         | 0.16%         | 0.20%         | 0.24%         | 0.27%         |
| Speculative Grade  | 1.25%         | 2.60%         | 3.99%         | 5.19%         | 6.12%         | 6.90%         | 7.34%         |
| All Ratings        | 0.07%         | 0.17%         | 0.28%         | 0.39%         | 0.48%         | 0.55%         | 0.61%         |
| <b>US CMBS</b>     | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa                | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| Aa                 | 0.04%         | 0.10%         | 0.10%         | 0.10%         | 0.10%         | 0.10%         | 0.10%         |
| A                  | 0.01%         | 0.04%         | 0.08%         | 0.08%         | 0.18%         | 0.46%         | 0.46%         |
| Baa                | 0.15%         | 0.44%         | 0.58%         | 0.66%         | 0.96%         | 1.07%         | 2.29%         |
| Ba                 | 0.14%         | 0.55%         | 1.61%         | 2.96%         | 4.30%         | 6.45%         | 7.53%         |
| B                  | 1.40%         | 3.60%         | 7.04%         | 11.24%        | 16.06%        | 20.77%        | 25.01%        |
| Caa                | 13.56%        | 24.58%        | 33.65%        | 42.57%        | 49.79%        | 53.82%        | 53.82%        |
| Investment Grade   | 0.04%         | 0.13%         | 0.17%         | 0.19%         | 0.29%         | 0.37%         | 0.68%         |
| Speculative Grade  | 1.39%         | 3.13%         | 5.62%         | 8.60%         | 11.80%        | 15.20%        | 17.68%        |
| All Ratings        | 0.34%         | 0.81%         | 1.42%         | 2.12%         | 2.89%         | 3.67%         | 4.42%         |
| <b>Global CDOs</b> | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa                | 0.01%         | 0.01%         | 0.03%         | 0.05%         | 0.08%         | 0.15%         | 0.32%         |
| Aa                 | 0.04%         | 0.12%         | 0.45%         | 1.19%         | 2.46%         | 4.16%         | 6.42%         |
| A                  | 0.25%         | 0.71%         | 1.21%         | 2.06%         | 2.96%         | 5.01%         | 7.39%         |
| Baa                | 1.53%         | 4.27%         | 7.60%         | 10.22%        | 12.58%        | 14.49%        | 16.11%        |
| Ba                 | 2.53%         | 6.07%         | 9.66%         | 12.39%        | 13.93%        | 15.18%        | 18.58%        |
| B                  | 9.51%         | 18.39%        | 26.02%        | 31.83%        | 37.23%        | 39.00%        | 39.00%        |
| Caa                | 12.91%        | 19.47%        | 24.97%        | 33.43%        | 46.85%        | 46.85%        | 46.85%        |
| Investment Grade   | 0.42%         | 1.20%         | 2.21%         | 3.22%         | 4.29%         | 5.51%         | 6.90%         |
| Speculative Grade  | 4.79%         | 9.62%         | 14.15%        | 17.82%        | 20.32%        | 21.65%        | 24.12%        |
| All Ratings        | 1.03%         | 2.42%         | 4.01%         | 5.45%         | 6.75%         | 7.98%         | 9.48%         |

| <b>Global Structured Finance</b> | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
|----------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Aaa                              | 0.03%         | 0.04%         | 0.04%         | 0.09%         | 0.21%         | 0.22%         | 0.22%         |
| Aa                               | 0.16%         | 0.37%         | 0.45%         | 0.79%         | 1.42%         | 1.81%         | 2.19%         |
| A                                | 0.46%         | 1.14%         | 1.44%         | 1.86%         | 2.41%         | 3.12%         | 3.69%         |
| Baa                              | 2.27%         | 5.18%         | 6.48%         | 8.52%         | 11.48%        | 14.58%        | 16.24%        |
| Ba                               | 4.73%         | 12.63%        | 15.48%        | 18.32%        | 20.58%        | 21.77%        | 23.35%        |
| B                                | 0.22%         | 1.86%         | 6.22%         | 10.32%        | 14.08%        | 18.22%        | 20.34%        |
| Caa                              | 0.82%         | 0.82%         | 3.13%         | 10.05%        | 22.04%        | 38.45%        | 38.45%        |
| Investment Grade                 | 0.41%         | 0.95%         | 1.19%         | 1.63%         | 2.27%         | 2.85%         | 3.22%         |
| Speculative Grade                | 3.61%         | 9.93%         | 13.15%        | 16.36%        | 19.15%        | 21.43%        | 23.13%        |
| All Ratings                      | 0.60%         | 1.49%         | 1.93%         | 2.56%         | 3.37%         | 4.09%         | 4.56%         |
| <b>US ABS, excluding HEL</b>     | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa                              | 0.08%         | 0.12%         | 0.15%         | 0.33%         | 0.71%         | 0.71%         | 0.71%         |
| Aa                               | 0.78%         | 1.75%         | 2.73%         | 4.38%         | 8.09%         | 10.27%        | 11.11%        |
| A                                | 0.08%         | 0.37%         | 1.16%         | 2.34%         | 3.47%         | 4.80%         | 5.50%         |
| Baa                              | 0.16%         | 1.51%         | 5.50%         | 9.34%         | 13.77%        | 20.08%        | 27.76%        |
| Ba                               | 2.06%         | 12.17%        | 25.23%        | 35.10%        | 44.67%        | 51.86%        | 64.58%        |
| B                                | 0.00%         | 8.22%         | 36.46%        | 36.46%        | 36.46%        | 36.46%        | 36.46%        |
| Caa                              | 66.67%        | 66.67%        | NA            | NA            | NA            | NA            | NA            |
| Investment Grade                 | 0.14%         | 0.39%         | 0.98%         | 1.82%         | 3.03%         | 4.13%         | 5.14%         |
| Speculative Grade                | 2.10%         | 11.87%        | 27.06%        | 35.42%        | 43.55%        | 49.68%        | 60.52%        |
| All Ratings                      | 0.17%         | 0.61%         | 1.47%         | 2.46%         | 3.80%         | 5.00%         | 6.20%         |
| <b>US HEL</b>                    | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa                              | 0.00%         | 0.00%         | 0.00%         | 0.07%         | 0.32%         | 0.36%         | 0.36%         |
| Aa                               | 0.07%         | 0.48%         | 0.48%         | 1.03%         | 1.18%         | 1.18%         | 1.18%         |
| A                                | 0.67%         | 2.47%         | 2.58%         | 2.77%         | 3.15%         | 3.39%         | 5.13%         |
| Baa                              | 4.94%         | 11.22%        | 11.94%        | 14.96%        | 22.02%        | 29.94%        | 30.97%        |
| Ba                               | 15.42%        | 40.60%        | 45.08%        | 50.55%        | 55.73%        | 57.87%        | 59.95%        |
| B                                | 1.29%         | 8.29%         | 34.03%        | 53.73%        | 57.66%        | 68.52%        | 68.52%        |
| Caa                              | 0.00%         | 0.00%         | NA            | NA            | NA            | NA            | NA            |
| Investment Grade                 | 1.08%         | 2.69%         | 2.86%         | 3.69%         | 5.24%         | 6.43%         | 6.72%         |
| Speculative Grade                | 14.69%        | 38.79%        | 44.44%        | 51.32%        | 56.21%        | 60.51%        | 62.00%        |
| All Ratings                      | 1.76%         | 4.48%         | 5.01%         | 6.13%         | 7.80%         | 9.14%         | 9.49%         |

| <b>US RMBS</b>     | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
|--------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Aaa                | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| Aa                 | 0.00%         | 0.00%         | 0.00%         | 0.05%         | 0.12%         | 0.12%         | 0.12%         |
| A                  | 0.00%         | 0.04%         | 0.23%         | 0.34%         | 0.51%         | 0.98%         | 0.98%         |
| Baa                | 0.29%         | 2.39%         | 2.56%         | 3.17%         | 3.48%         | 3.91%         | 4.20%         |
| Ba                 | 0.31%         | 3.46%         | 4.34%         | 5.96%         | 6.23%         | 7.65%         | 8.63%         |
| B                  | 0.21%         | 1.66%         | 3.81%         | 5.98%         | 8.45%         | 10.67%        | 11.79%        |
| Caa                | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| Investment Grade   | 0.02%         | 0.17%         | 0.19%         | 0.25%         | 0.29%         | 0.35%         | 0.37%         |
| Speculative Grade  | 0.28%         | 2.87%         | 4.19%         | 6.01%         | 7.06%         | 8.73%         | 9.75%         |
| All Ratings        | 0.03%         | 0.26%         | 0.34%         | 0.48%         | 0.58%         | 0.74%         | 0.82%         |
| <b>US CMBS</b>     | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa                | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| Aa                 | 0.00%         | 0.18%         | 0.18%         | 0.18%         | 0.18%         | 0.18%         | 0.18%         |
| A                  | 0.00%         | 0.00%         | 0.12%         | 0.12%         | 0.12%         | 0.93%         | 0.93%         |
| Baa                | 0.00%         | 0.11%         | 0.27%         | 0.38%         | 0.69%         | 0.69%         | 0.69%         |
| Ba                 | 0.00%         | 0.00%         | 0.39%         | 0.89%         | 1.37%         | 1.37%         | 2.23%         |
| B                  | 0.10%         | 0.46%         | 1.40%         | 3.91%         | 8.27%         | 11.15%        | 14.41%        |
| Caa                | 0.00%         | 0.00%         | 3.51%         | 11.23%        | 23.91%        | 41.81%        | 41.81%        |
| Investment Grade   | 0.00%         | 0.06%         | 0.12%         | 0.15%         | 0.22%         | 0.38%         | 0.38%         |
| Speculative Grade  | 0.04%         | 0.20%         | 0.90%         | 2.47%         | 5.07%         | 7.03%         | 8.97%         |
| All Ratings        | 0.01%         | 0.09%         | 0.29%         | 0.69%         | 1.38%         | 1.98%         | 2.43%         |
| <b>Global CDOs</b> | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa                | 0.18%         | 0.18%         | 0.18%         | 0.18%         | 0.18%         | 0.18%         | 0.18%         |
| Aa                 | 0.53%         | 0.58%         | 0.58%         | 0.68%         | 1.28%         | 1.84%         | 4.06%         |
| A                  | 1.31%         | 1.76%         | 2.10%         | 2.42%         | 3.11%         | 3.44%         | 4.71%         |
| Baa                | 2.98%         | 4.42%         | 8.01%         | 10.87%        | 13.16%        | 15.21%        | 16.44%        |
| Ba                 | 3.36%         | 6.44%         | 9.70%         | 13.37%        | 16.40%        | 16.81%        | 16.81%        |
| B                  | 0.82%         | 8.34%         | 25.52%        | 38.71%        | 43.30%        | 53.61%        | 53.61%        |
| Caa                | 0.00%         | 0.00%         | 0.00%         | 0.00%         | NA            | NA            | NA            |
| Investment Grade   | 1.07%         | 1.49%         | 2.40%         | 3.21%         | 4.03%         | 4.77%         | 5.76%         |
| Speculative Grade  | 3.15%         | 6.60%         | 11.24%        | 16.04%        | 19.32%        | 21.42%        | 21.42%        |
| All Ratings        | 1.27%         | 1.99%         | 3.30%         | 4.57%         | 5.70%         | 6.62%         | 7.48%         |

## Appendix V: Estimated Historical Average Loss Rates<sup>14</sup>

| Global Structured Finance | 1-Year | 2-Year | 3-Year | 4-Year | 5-year | 6-Year | 7-year |
|---------------------------|--------|--------|--------|--------|--------|--------|--------|
| Aaa                       | 0.00%  | 0.01%  | 0.01%  | 0.02%  | 0.03%  | 0.03%  | 0.03%  |
| Aa                        | 0.08%  | 0.20%  | 0.41%  | 0.68%  | 0.92%  | 1.07%  | 1.21%  |
| A                         | 0.17%  | 0.46%  | 0.81%  | 1.17%  | 1.50%  | 1.85%  | 2.02%  |
| Baa                       | 0.61%  | 1.52%  | 2.74%  | 3.86%  | 5.03%  | 6.12%  | 7.10%  |
| Ba                        | 2.06%  | 4.22%  | 6.23%  | 8.19%  | 9.31%  | 10.37% | 11.23% |
| B                         | 3.34%  | 6.37%  | 9.38%  | 11.79% | 14.00% | 15.71% | 16.99% |
| Caa                       | 12.03% | 18.29% | 23.47% | 30.47% | 34.30% | 35.81% | 35.81% |
| Investment Grade          | 0.11%  | 0.28%  | 0.51%  | 0.73%  | 0.95%  | 1.14%  | 1.29%  |
| Speculative Grade         | 3.05%  | 5.71%  | 8.19%  | 10.48% | 12.03% | 13.31% | 14.28% |
| All Ratings               | 0.31%  | 0.65%  | 1.05%  | 1.42%  | 1.73%  | 1.99%  | 2.18%  |
| US ABS, excluding HEL     | 1-Year | 2-Year | 3-Year | 4-Year | 5-year | 6-Year | 7-year |
| Aaa                       | 0.01%  | 0.03%  | 0.06%  | 0.09%  | 0.09%  | 0.09%  | 0.09%  |
| Aa                        | 0.49%  | 1.22%  | 2.24%  | 3.32%  | 4.36%  | 4.93%  | 5.30%  |
| A                         | 0.25%  | 0.90%  | 1.70%  | 2.42%  | 3.07%  | 3.58%  | 3.72%  |
| Baa                       | 1.34%  | 3.54%  | 6.37%  | 9.00%  | 13.07% | 17.30% | 20.77% |
| Ba                        | 8.11%  | 17.57% | 26.13% | 38.26% | 43.79% | 48.54% | 52.18% |
| B                         | 11.25% | 18.76% | 24.74% | 28.28% | 35.21% | 38.61% | 38.61% |
| Caa                       | 19.49% | 29.21% | 38.45% | 61.89% | 61.89% | NA     | NA     |
| Investment Grade          | 0.22%  | 0.64%  | 1.19%  | 1.73%  | 2.42%  | 3.03%  | 3.51%  |
| Speculative Grade         | 10.69% | 19.70% | 27.71% | 38.73% | 44.22% | 48.48% | 51.20% |
| All Ratings               | 0.64%  | 1.40%  | 2.20%  | 2.99%  | 3.77%  | 4.45%  | 4.98%  |
| US HEL                    | 1-Year | 2-Year | 3-Year | 4-Year | 5-year | 6-Year | 7-year |
| Aaa                       | 0.00%  | 0.00%  | 0.01%  | 0.02%  | 0.02%  | 0.03%  | 0.03%  |
| Aa                        | 0.03%  | 0.06%  | 0.15%  | 0.38%  | 0.43%  | 0.43%  | 0.43%  |
| A                         | 0.22%  | 0.44%  | 0.62%  | 0.77%  | 0.92%  | 1.19%  | 1.56%  |
| Baa                       | 0.91%  | 2.03%  | 3.64%  | 5.72%  | 7.08%  | 7.89%  | 8.21%  |
| Ba                        | 5.53%  | 9.55%  | 13.17% | 16.00% | 17.85% | 19.28% | 20.88% |
| B                         | 13.70% | 22.74% | 30.17% | 33.78% | 36.04% | 37.84% | 39.12% |
| Caa                       | 20.72% | 22.81% | 23.04% | 23.27% | 23.29% | 23.32% | 23.32% |
| Investment Grade          | 0.19%  | 0.42%  | 0.69%  | 0.99%  | 1.15%  | 1.25%  | 1.32%  |
| Speculative Grade         | 7.24%  | 12.25% | 16.75% | 19.82% | 21.81% | 23.44% | 24.97% |
| All Ratings               | 0.48%  | 0.88%  | 1.30%  | 1.70%  | 1.94%  | 2.11%  | 2.23%  |

<sup>14</sup> Note: Given the increased number of impairments and generally higher LGD rates experienced in 2007, one might expect the loss rates in the following Exhibits to be higher. Two factors work to mitigate the expected upwards drift in cumulative loss rates. First, the new, expanded dataset no longer collapses *pari passu* tranches and includes wrapped securities, which increases the share of Aaa-rated tranches and decreases overall impairment and loss rates. Furthermore, some 2007 impairments were first rated after the formation of the last cohort (Jan 2007), and hence were not included in the cohort cumulative loss calculations.

| <b>US RMBS</b>     | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
|--------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Aaa                | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| Aa                 | 0.00%         | 0.01%         | 0.02%         | 0.02%         | 0.02%         | 0.02%         | 0.02%         |
| A                  | 0.04%         | 0.09%         | 0.14%         | 0.21%         | 0.25%         | 0.25%         | 0.25%         |
| Baa                | 0.08%         | 0.18%         | 0.30%         | 0.43%         | 0.49%         | 0.53%         | 0.54%         |
| Ba                 | 0.37%         | 0.84%         | 1.31%         | 1.74%         | 2.03%         | 2.39%         | 2.52%         |
| B                  | 1.31%         | 2.67%         | 3.98%         | 4.90%         | 5.27%         | 5.44%         | 5.70%         |
| Caa                | 21.93%        | 21.93%        | 21.93%        | 21.93%        | 21.93%        | 21.93%        | 21.93%        |
| Investment Grade   | 0.01%         | 0.02%         | 0.03%         | 0.04%         | 0.05%         | 0.05%         | 0.05%         |
| Speculative Grade  | 0.70%         | 1.46%         | 2.24%         | 2.84%         | 3.15%         | 3.46%         | 3.63%         |
| All Ratings        | 0.03%         | 0.07%         | 0.12%         | 0.16%         | 0.19%         | 0.21%         | 0.22%         |
| <b>US CMBS</b>     | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa                | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| Aa                 | 0.01%         | 0.02%         | 0.02%         | 0.02%         | 0.02%         | 0.02%         | 0.02%         |
| A                  | 0.00%         | 0.02%         | 0.03%         | 0.03%         | 0.06%         | 0.12%         | 0.12%         |
| Baa                | 0.04%         | 0.11%         | 0.15%         | 0.17%         | 0.20%         | 0.21%         | 0.24%         |
| Ba                 | 0.07%         | 0.26%         | 0.71%         | 1.25%         | 1.70%         | 2.54%         | 2.85%         |
| B                  | 0.96%         | 2.48%         | 4.85%         | 7.42%         | 9.01%         | 10.89%        | 13.57%        |
| Caa                | 7.27%         | 10.73%        | 15.59%        | 20.37%        | 24.24%        | 26.40%        | 26.40%        |
| Investment Grade   | 0.01%         | 0.03%         | 0.05%         | 0.05%         | 0.07%         | 0.07%         | 0.08%         |
| Speculative Grade  | 0.78%         | 1.76%         | 3.15%         | 4.65%         | 5.72%         | 7.05%         | 8.01%         |
| All Ratings        | 0.15%         | 0.35%         | 0.62%         | 0.90%         | 1.09%         | 1.29%         | 1.42%         |
| <b>Global CDOs</b> | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa                | 0.00%         | 0.00%         | 0.00%         | 0.01%         | 0.01%         | 0.02%         | 0.04%         |
| Aa                 | 0.03%         | 0.10%         | 0.33%         | 0.79%         | 1.32%         | 1.97%         | 2.99%         |
| A                  | 0.23%         | 0.59%         | 1.03%         | 1.76%         | 2.63%         | 4.41%         | 6.49%         |
| Baa                | 1.16%         | 3.15%         | 5.61%         | 7.50%         | 8.93%         | 10.03%        | 10.82%        |
| Ba                 | 1.99%         | 4.79%         | 7.48%         | 9.45%         | 10.62%        | 11.56%        | 14.08%        |
| B                  | 7.08%         | 13.43%        | 18.78%        | 22.48%        | 25.30%        | 26.28%        | 26.28%        |
| Caa                | 9.90%         | 14.76%        | 18.47%        | 24.75%        | 35.13%        | 35.13%        | 35.13%        |
| Investment Grade   | 0.32%         | 0.89%         | 1.64%         | 2.35%         | 2.96%         | 3.63%         | 4.33%         |
| Speculative Grade  | 3.69%         | 7.36%         | 10.65%        | 13.21%        | 14.86%        | 15.79%        | 17.62%        |
| All Ratings        | 0.79%         | 1.83%         | 2.99%         | 4.01%         | 4.78%         | 5.48%         | 6.29%         |



| <b>Global Structured Finance</b> | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
|----------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Aaa                              | 0.01%         | 0.02%         | 0.02%         | 0.03%         | 0.03%         | 0.03%         | 0.03%         |
| Aa                               | 0.11%         | 0.28%         | 0.33%         | 0.44%         | 0.74%         | 0.93%         | 1.01%         |
| A                                | 0.38%         | 0.94%         | 1.13%         | 1.36%         | 1.66%         | 1.96%         | 2.18%         |
| Baa                              | 1.23%         | 2.68%         | 3.51%         | 4.44%         | 5.37%         | 6.22%         | 6.80%         |
| Ba                               | 2.98%         | 7.68%         | 9.41%         | 10.64%        | 11.56%        | 12.02%        | 12.69%        |
| B                                | 0.15%         | 1.18%         | 4.23%         | 6.40%         | 8.31%         | 9.77%         | 10.66%        |
| Caa                              | 0.55%         | 0.55%         | 2.48%         | 6.83%         | 15.24%        | 22.99%        | 22.99%        |
| Investment Grade                 | 0.24%         | 0.55%         | 0.70%         | 0.90%         | 1.11%         | 1.30%         | 1.42%         |
| Speculative Grade                | 2.28%         | 6.05%         | 8.11%         | 9.62%         | 10.90%        | 11.76%        | 12.48%        |
| All Ratings                      | 0.36%         | 0.88%         | 1.16%         | 1.45%         | 1.74%         | 1.98%         | 2.15%         |
| <b>US ABS, excluding HEL</b>     | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa                              | 0.05%         | 0.08%         | 0.09%         | 0.14%         | 0.16%         | 0.16%         | 0.16%         |
| Aa                               | 0.68%         | 1.32%         | 1.98%         | 2.66%         | 4.52%         | 5.55%         | 5.85%         |
| A                                | 0.06%         | 0.18%         | 0.70%         | 1.41%         | 2.05%         | 2.71%         | 2.96%         |
| Baa                              | 0.12%         | 1.08%         | 3.83%         | 6.18%         | 8.56%         | 11.70%        | 15.01%        |
| Ba                               | 1.73%         | 9.23%         | 18.05%        | 23.63%        | 27.67%        | 31.16%        | 37.46%        |
| B                                | 0.00%         | 4.91%         | 24.85%        | 24.85%        | 24.85%        | 24.85%        | 24.85%        |
| Caa                              | 44.75%        | 44.75%        | NA            | NA            | NA            | NA            | NA            |
| Investment Grade                 | 0.10%         | 0.27%         | 0.66%         | 1.11%         | 1.64%         | 2.18%         | 2.60%         |
| Speculative Grade                | 1.71%         | 8.83%         | 19.22%        | 23.95%        | 27.38%        | 30.36%        | 35.72%        |
| All Ratings                      | 0.13%         | 0.43%         | 1.01%         | 1.54%         | 2.13%         | 2.72%         | 3.23%         |
| <b>US HEL</b>                    | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa                              | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.01%         | 0.01%         | 0.01%         |
| Aa                               | 0.06%         | 0.44%         | 0.44%         | 0.52%         | 0.53%         | 0.53%         | 0.53%         |
| A                                | 0.52%         | 2.13%         | 2.17%         | 2.24%         | 2.31%         | 2.37%         | 2.70%         |
| Baa                              | 2.38%         | 5.67%         | 6.18%         | 7.11%         | 8.51%         | 9.35%         | 9.43%         |
| Ba                               | 9.33%         | 24.07%        | 26.77%        | 28.39%        | 30.68%        | 31.25%        | 32.08%        |
| B                                | 1.03%         | 6.00%         | 23.17%        | 32.51%        | 32.58%        | 36.63%        | 36.63%        |
| Caa                              | 0.00%         | 0.00%         | NA            | NA            | NA            | NA            | NA            |
| Investment Grade                 | 0.55%         | 1.53%         | 1.65%         | 1.89%         | 2.17%         | 2.30%         | 2.34%         |
| Speculative Grade                | 8.91%         | 23.06%        | 26.55%        | 28.95%        | 30.73%        | 32.17%        | 32.76%        |
| All Ratings                      | 0.96%         | 2.59%         | 2.93%         | 3.28%         | 3.61%         | 3.80%         | 3.86%         |

| <b>US RMBS</b>     | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
|--------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Aaa                | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| Aa                 | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.02%         | 0.02%         | 0.02%         |
| A                  | 0.00%         | 0.00%         | 0.08%         | 0.10%         | 0.10%         | 0.20%         | 0.20%         |
| Baa                | 0.17%         | 0.66%         | 0.69%         | 0.89%         | 0.96%         | 0.99%         | 1.00%         |
| Ba                 | 0.20%         | 1.63%         | 1.96%         | 2.55%         | 2.63%         | 2.93%         | 3.14%         |
| B                  | 0.17%         | 0.93%         | 2.50%         | 3.73%         | 5.36%         | 5.88%         | 6.01%         |
| Caa                | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| Investment Grade   | 0.01%         | 0.05%         | 0.05%         | 0.07%         | 0.08%         | 0.08%         | 0.08%         |
| Speculative Grade  | 0.19%         | 1.40%         | 2.17%         | 2.99%         | 3.61%         | 3.99%         | 4.17%         |
| All Ratings        | 0.02%         | 0.09%         | 0.13%         | 0.19%         | 0.23%         | 0.26%         | 0.27%         |
| <b>US CMBS</b>     | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa                | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| Aa                 | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| A                  | 0.00%         | 0.00%         | 0.04%         | 0.04%         | 0.04%         | 0.21%         | 0.21%         |
| Baa                | 0.00%         | 0.02%         | 0.09%         | 0.12%         | 0.19%         | 0.19%         | 0.19%         |
| Ba                 | 0.00%         | 0.00%         | 0.15%         | 0.33%         | 0.45%         | 0.45%         | 0.73%         |
| B                  | 0.07%         | 0.25%         | 0.97%         | 2.39%         | 4.79%         | 5.98%         | 7.34%         |
| Caa                | 0.00%         | 0.00%         | 2.93%         | 7.79%         | 16.68%        | 25.13%        | 25.13%        |
| Investment Grade   | 0.00%         | 0.01%         | 0.03%         | 0.04%         | 0.06%         | 0.08%         | 0.08%         |
| Speculative Grade  | 0.03%         | 0.10%         | 0.55%         | 1.33%         | 2.71%         | 3.46%         | 4.22%         |
| All Ratings        | 0.01%         | 0.03%         | 0.15%         | 0.32%         | 0.65%         | 0.84%         | 1.01%         |
| <b>Global CDOs</b> | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa                | 0.05%         | 0.05%         | 0.05%         | 0.05%         | 0.05%         | 0.05%         | 0.05%         |
| Aa                 | 0.33%         | 0.37%         | 0.37%         | 0.45%         | 0.75%         | 1.06%         | 1.38%         |
| A                  | 1.16%         | 1.49%         | 1.75%         | 1.97%         | 2.54%         | 2.82%         | 3.92%         |
| Baa                | 2.07%         | 2.97%         | 5.11%         | 6.92%         | 8.19%         | 9.18%         | 9.38%         |
| Ba                 | 2.33%         | 4.54%         | 6.59%         | 8.64%         | 10.01%        | 10.28%        | 10.28%        |
| B                  | 0.50%         | 6.03%         | 17.35%        | 24.18%        | 26.75%        | 28.86%        | 28.86%        |
| Caa                | 0.00%         | 0.00%         | 0.00%         | 0.00%         | NA            | NA            | NA            |
| Investment Grade   | 0.76%         | 1.03%         | 1.59%         | 2.10%         | 2.59%         | 2.97%         | 3.26%         |
| Speculative Grade  | 2.18%         | 4.67%         | 7.64%         | 10.25%        | 11.83%        | 12.41%        | 12.41%        |
| All Ratings        | 0.90%         | 1.39%         | 2.20%         | 2.96%         | 3.58%         | 4.00%         | 4.25%         |

## Appendix VI: One-Year Rating Transition Matrix with a Principal Impairment Column<sup>15</sup>

| Global Structured Finance | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa    | Principal Impairment | WR     |
|---------------------------|--------|--------|--------|--------|--------|--------|--------|----------------------|--------|
| Aaa                       | 85.55% | 0.20%  | 0.07%  | 0.02%  | 0.02%  | 0.01%  | 0.01%  | 0.01%                | 14.13% |
| Aa                        | 5.81%  | 84.88% | 1.30%  | 0.45%  | 0.12%  | 0.10%  | 0.04%  | 0.12%                | 7.20%  |
| A                         | 1.12%  | 3.58%  | 84.85% | 2.23%  | 0.64%  | 0.23%  | 0.10%  | 0.20%                | 7.05%  |
| Baa                       | 0.31%  | 0.50%  | 2.66%  | 84.93% | 2.55%  | 1.31%  | 0.46%  | 1.00%                | 6.27%  |
| Ba                        | 0.11%  | 0.08%  | 0.46%  | 2.73%  | 82.98% | 3.03%  | 1.58%  | 3.03%                | 6.00%  |
| B                         | 0.05%  | 0.03%  | 0.08%  | 0.35%  | 2.13%  | 82.93% | 4.56%  | 4.72%                | 5.15%  |
| Caa                       | 0.10%  | 0.00%  | 0.00%  | 0.21%  | 0.38%  | 2.06%  | 72.40% | 16.69%               | 8.17%  |
| US ABS, excluding HEL     | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa    | Principal Impairment | WR     |
| Aaa                       | 83.81% | 0.43%  | 0.24%  | 0.09%  | 0.08%  | 0.04%  | 0.03%  | 0.03%                | 15.26% |
| Aa                        | 2.19%  | 80.83% | 4.13%  | 1.70%  | 0.54%  | 0.58%  | 0.23%  | 0.84%                | 8.97%  |
| A                         | 0.70%  | 2.46%  | 80.73% | 3.91%  | 0.84%  | 0.33%  | 0.21%  | 0.31%                | 10.51% |
| Baa                       | 0.40%  | 0.36%  | 1.49%  | 81.15% | 4.87%  | 1.38%  | 0.67%  | 1.63%                | 8.03%  |
| Ba                        | 0.09%  | 0.03%  | 0.21%  | 2.25%  | 69.71% | 7.12%  | 4.02%  | 9.79%                | 6.78%  |
| B                         | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 71.72% | 11.74% | 14.11%               | 2.43%  |
| Caa                       | 0.00%  | 0.00%  | 0.00%  | 0.09%  | 0.28%  | 0.40%  | 69.61% | 24.93%               | 4.68%  |
| US HEL                    | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa    | Principal Impairment | WR     |
| Aaa                       | 82.12% | 0.13%  | 0.04%  | 0.01%  | 0.00%  | 0.00%  | 0.01%  | 0.01%                | 17.69% |
| Aa                        | 2.09%  | 91.46% | 1.02%  | 0.33%  | 0.09%  | 0.04%  | 0.02%  | 0.03%                | 4.92%  |
| A                         | 0.22%  | 1.75%  | 90.47% | 2.25%  | 0.94%  | 0.42%  | 0.08%  | 0.25%                | 3.62%  |
| Baa                       | 0.02%  | 0.11%  | 0.91%  | 87.33% | 3.17%  | 2.47%  | 0.66%  | 1.64%                | 3.70%  |
| Ba                        | 0.00%  | 0.07%  | 0.04%  | 0.77%  | 79.35% | 5.21%  | 2.99%  | 8.80%                | 2.77%  |
| B                         | 0.00%  | 0.00%  | 0.26%  | 0.26%  | 0.45%  | 70.25% | 4.54%  | 21.44%               | 2.80%  |
| Caa                       | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 58.42% | 33.44%               | 8.14%  |
| US RMBS                   | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa    | Principal Impairment | WR     |
| Aaa                       | 87.02% | 0.01%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%                | 12.96% |
| Aa                        | 8.30%  | 84.61% | 0.07%  | 0.02%  | 0.00%  | 0.00%  | 0.00%  | 0.01%                | 6.98%  |
| A                         | 1.23%  | 5.13%  | 85.93% | 0.93%  | 0.29%  | 0.07%  | 0.01%  | 0.09%                | 6.33%  |
| Baa                       | 0.28%  | 0.58%  | 4.27%  | 86.72% | 0.87%  | 0.67%  | 0.15%  | 0.30%                | 6.16%  |
| Ba                        | 0.07%  | 0.15%  | 1.01%  | 5.32%  | 85.76% | 0.61%  | 0.37%  | 0.74%                | 5.98%  |
| B                         | 0.00%  | 0.04%  | 0.14%  | 0.55%  | 4.75%  | 85.81% | 0.43%  | 1.86%                | 6.42%  |
| Caa                       | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 10.91% | 0.00%  | 48.18% | 40.91%               | 0.00%  |

<sup>15</sup> Principal-impaired securities whose ratings were withdrawn within a 12-month period are included in the principal impairment column.

| US CMBS | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa    | Principal Impairment | WR    |
|---------|--------|--------|--------|--------|--------|--------|--------|----------------------|-------|
| Aaa     | 90.15% | 0.38%  | 0.00%  | 0.00%  | 0.00%  | 0.01%  | 0.00%  | 0.00%                | 9.46% |
| Aa      | 17.42% | 74.52% | 0.61%  | 0.02%  | 0.00%  | 0.02%  | 0.00%  | 0.04%                | 7.37% |
| A       | 4.29%  | 10.44% | 78.31% | 1.18%  | 0.21%  | 0.01%  | 0.00%  | 0.01%                | 5.55% |
| Baa     | 0.89%  | 1.41%  | 6.54%  | 81.37% | 1.73%  | 0.32%  | 0.06%  | 0.14%                | 7.54% |
| Ba      | 0.22%  | 0.03%  | 0.54%  | 3.22%  | 89.76% | 2.16%  | 0.18%  | 0.14%                | 3.76% |
| B       | 0.11%  | 0.02%  | 0.02%  | 0.17%  | 1.17%  | 91.06% | 3.96%  | 1.39%                | 2.10% |
| Caa     | 0.16%  | 0.00%  | 0.00%  | 0.00%  | 0.12%  | 0.92%  | 81.43% | 13.28%               | 4.09% |

| Global CDOs | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa    | Principal Impairment | WR     |
|-------------|--------|--------|--------|--------|--------|--------|--------|----------------------|--------|
| Aaa         | 90.75% | 1.23%  | 0.28%  | 0.11%  | 0.03%  | 0.01%  | 0.01%  | 0.01%                | 7.57%  |
| Aa          | 2.33%  | 85.60% | 3.45%  | 1.17%  | 0.28%  | 0.11%  | 0.04%  | 0.03%                | 6.99%  |
| A           | 0.78%  | 1.97%  | 85.71% | 2.70%  | 0.95%  | 0.30%  | 0.18%  | 0.24%                | 7.16%  |
| Baa         | 0.24%  | 0.53%  | 1.26%  | 84.44% | 3.21%  | 1.52%  | 0.66%  | 1.48%                | 6.65%  |
| Ba          | 0.09%  | 0.11%  | 0.33%  | 1.49%  | 81.66% | 3.38%  | 2.47%  | 2.43%                | 8.05%  |
| B           | 0.00%  | 0.12%  | 0.16%  | 0.69%  | 2.58%  | 68.40% | 10.06% | 9.08%                | 8.92%  |
| Caa         | 0.00%  | 0.00%  | 0.00%  | 0.55%  | 0.53%  | 2.68%  | 72.75% | 12.18%               | 11.31% |

## Moody's Related Research

### Special Comments:

- Default & Loss Rates of Structured Finance Securities: 1993-2006, April 2007 (102733)
- Default & Loss Rates of Structured Finance Securities: 1993-2005, April 2006 (97234)
- Default & Loss Rates of Structured Finance Securities: 1993-2004, July 2005 (93653)
- Default & Loss Rates of U.S. CDOs: 1993-2003, March 2005 (91692)
- Measuring Loss-Given-Default for Structured Finance Securities: An Update, December 2006 (101284)
- Measuring Loss Severity Rates of Defaulted Residential Mortgage Backed Securities: A Methodology, April 2004 (86769)
- Payment Defaults and Material Impairments of U.S. Structured Finance Securities: 1993-2002, December 2003 (80247)
- Structured Finance Rating Transitions: 1983-2007, February 2008 (107444)
- Japanese Structured Finance Rating Transitions: 1994-2007, March 2008 (107833 / SF125229)
- Asia-Pacific (ex-Japan) Structured Finance Rating Transitions: 1990-2007, March 2008 (107947)
- EMEA Structured Finance Rating Transitions: 1988-2007, March 2008 (107977)
- The Performance of Structured Finance Ratings: Mid-Year 2007 Report, October 2007 (105390)
- Deal Sponsor and Credit Risk of U.S. ABS and MBS Securities, December 2006 (100872)
- The Relationship between Par Coupon Spreads and Credit Ratings in US Structured Finance, December 2005 (95494)
- Structured Finance Watchlist Resolutions: 1992-2003, June 2004 (87305)
- Corporate Default and Recovery Rates, 1920-2007, February 2008 (107385)
- Guide to Moody's Default Research: March 2008 Update, March 2008 (108157)

*To access any of these reports, click on the entry above. Note that these references are current as of the date of publication of this report and that more recent reports may be available. All research may not be available to all clients.*

Report Number: 109707

**Authors**

Kumar Kanthan  
Julia Tung  
Matthew Woolley  
Hadas Alexander  
Debjani Dutta Roy  
Geraldine Kim

**Production Associate**

David Heston



**Moody's Investors Service**

# Moody's Global Credit Policy

August 2009

## Default & Loss Rates of Structured Finance Securities: 1993-2008

### Summary Opinion

This *Special Comment* presents Moody's seventh annual report of the material impairment and loss rates of global structured finance securities, covering the credit performance through year-end 2008 of all structured finance securities issued since 1993. The following are the highlights of this report:

The number of newly impaired tranches rose to 12,666 in 2008 from 2,141 in 2007. Of these, 12,425 experienced principal losses or were downgraded to Ca or C ("principal impairments"), while 241 experienced only interest shortfalls ("interest impairments").

Trailing 12-month impairment rates rose for all rating categories in 2008. It is important to note that our definition of material impairment includes downgrade to Ca or C, which often occurs far in advance of any actual interest shortfall or principal write-down. While securities downgraded to Ca/C are expected to eventually experience losses, our short-term impairment rates will likely be higher than "default" rates calculated using alternative definitions.

As in 2007, the 2008 impairments were concentrated in securities associated with the US residential mortgage sector, with US HEL, US RMBS, and global SF CDOs accounting for 51%, 25%, and 20% of impairments for the year, respectively.

Transactions that closed in recent years have performed worse than earlier deals with securities issued between 2005 and 2007 accounting for 93% of newly impaired securities.

The length and depth of the US housing crisis and prolonged global economic downturn suggest that impairment rates in 2009 may be at similar levels.

Final loss severity rates (LGDs) on impaired securities have averaged 81% as a share of the original balance for the 4,913 principal impaired securities since 1993 that have reached a resolution (i.e., with zero outstanding principal balance) at the end of the study period. The high average LGD reflects the large losses experienced by recently securitized US residential mortgage pools as 83% of the sample of resolved impairments consists of US RMBS and HEL tranches from the 2005 to 2007 vintages.

### Table of Contents:

|   |    |
|---|----|
| Summary Opinion   | 1  |
| Issuance and Distribution of Global Structured Finance Ratings                      | 2  |
| 2008 Material Impairments   | 3  |
| Sector Specific Analysis of Impairments   | 8  |
| Loss-Given-Default on Principal Impaired Tranches and Historical Average Loss Rates | 17 |
| Appendix I: Description of Data Sample and Glossary                                 | 22 |
| Appendix II: Calculating Multi-Year Material Impairment and LGD Rates               | 26 |
| Appendix III: Material Impairment Rates   | 29 |
| Appendix IV: Estimated Historical Average Loss Rates                                | 37 |
| Appendix V: One-Year Rating Transition Matrix with a Material Impairment Column     | 45 |
| Moody's Related Research  | 48 |

### Analyst Contacts:

**New York**                    **1.212.553.1653**

**Julia Tung**

*Vice President - Senior Credit Officer*

**Nicolas S. Weill**

*Group Managing Director - Chief Credit Officer*

**London**                    **44.20.7772.5454**

**David Rosa**

*Senior Vice President*

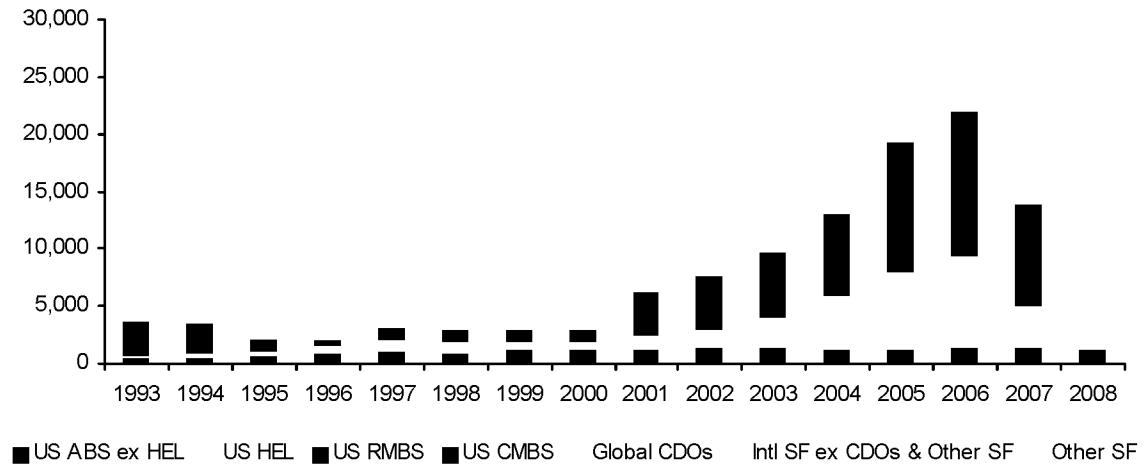


**Moody's Investors Service**

## Issuance and Distribution of Global Structured Finance Ratings

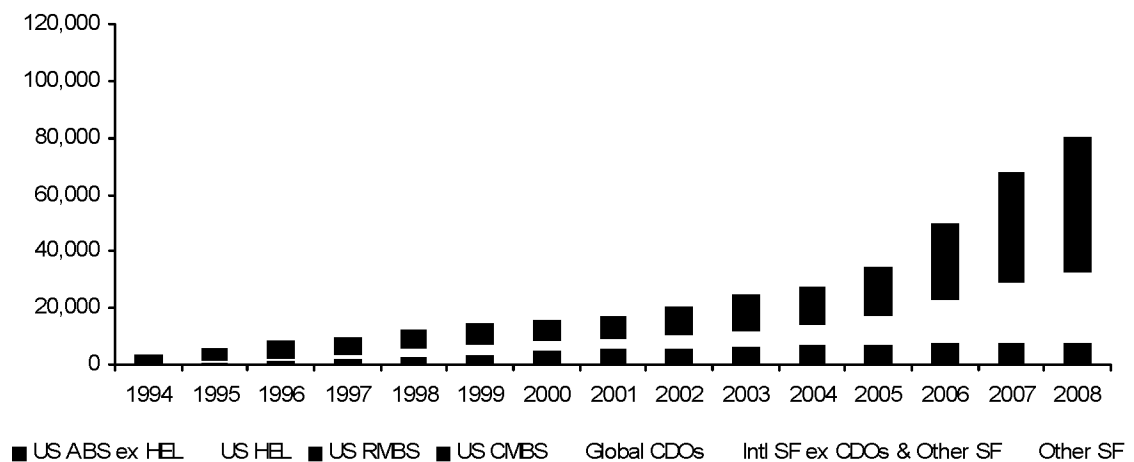
Structured finance issuance continued to decline in 2008, down 87% from the number of new securities rated in 2007 and 91% from the peak in 2006 (Exhibit 1). Issuance fell sharply in all sectors with the steepest declines occurring among US RMBS and HEL.

**Exhibit 1: Number of New Ratings by Closing Year**



However, the robust issuance in the years prior to 2008 still led to growth in the number of outstanding ratings from January 2007 to January 2008 (Exhibit 2). Global CDOs and US RMBS experienced the largest percentage increase in the number of ratings outstanding at 28% and 25%, respectively, while US ABS excluding HEL showed the smallest increase at 6%.

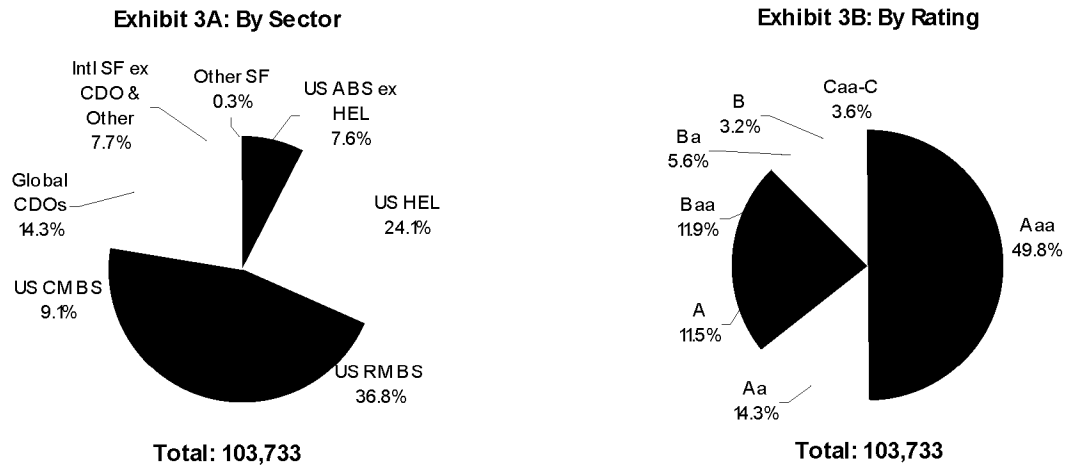
**Exhibit 2: Number of Ratings Outstanding at the Beginning of Each Year**



As has been the case for the last two years, US RMBS, US HEL, and global CDOs took the top three spots in terms of the number of outstanding ratings (Exhibit 3A). US RMBS and HEL combined accounted for 61% of the ratings as of the beginning of the year and global CDOs accounted for an additional 14%. Also similar to last year, around half of the ratings outstanding were Aaa (Exhibit 3B). However, downgrade activity in 2007 caused the percentage of non-investment grade ratings to rise to roughly 12% and the proportion of securities rated Caa and below to increase as well.



### Exhibit 3: Distribution of Outstanding Ratings on 1/1/08



## 2008 Material Impairments

### Structured Finance Material Impairments

Moody's first introduced the concept of material impairment in 2003 in order to differentiate the definition of default between the corporate and structured finance sectors.<sup>1</sup> We further differentiated material impairments into two categories: principal impairments and interest impairments.<sup>2</sup> Principal impairments include securities that had outstanding principal write-downs or losses and securities that were downgraded to Ca or C, even if they have not yet experienced an interest shortfall or principal write-down.<sup>3</sup> Interest impairments, or interest impaired securities, include securities that are not principal impaired, but have outstanding interest shortfalls.<sup>4</sup>

The actual impairment classification is based on a security's status as of the end of the study period. For example, a security that initially experienced an interest shortfall before suffering a principal write-down several months later would be classified as a principal impairment with an impairment date equal to when the interest shortfall occurred. If, however, the interest shortfall is cured before the principal write-down occurs, then the impairment date coincides with the date of the principal write-down. Lastly, if a tranche was not downgraded to Ca/C and all interest shortfalls and principal write-downs were cured (repaid) as of the end of the study period, then it would no longer be considered impaired and would not appear in our sample of impairments.

### 2008 Material Impairment Summary

The number of material impairments rose to 12,666 in 2008 from 2,141 in 2007 amidst the global economic downturn (Exhibit 4). Of the impairments in 2008, 12,425 were principal impairments and 241 were interest impairments. Note that interest impairments are relatively infrequent in prior years because most interest impairments are eventually either cured, and thus are removed from the list of impairments, or become principal impaired.

<sup>1</sup> See Moody's Special Comment, "Payment Defaults and Material Impairments of U.S. Structured Finance Securities: 1993-2002," December 2003.

<sup>2</sup> See the glossary in Appendix I for further details on the definition of impairment.

<sup>3</sup> Securities that have been downgraded to Ca/C are expected to sustain losses ultimately.

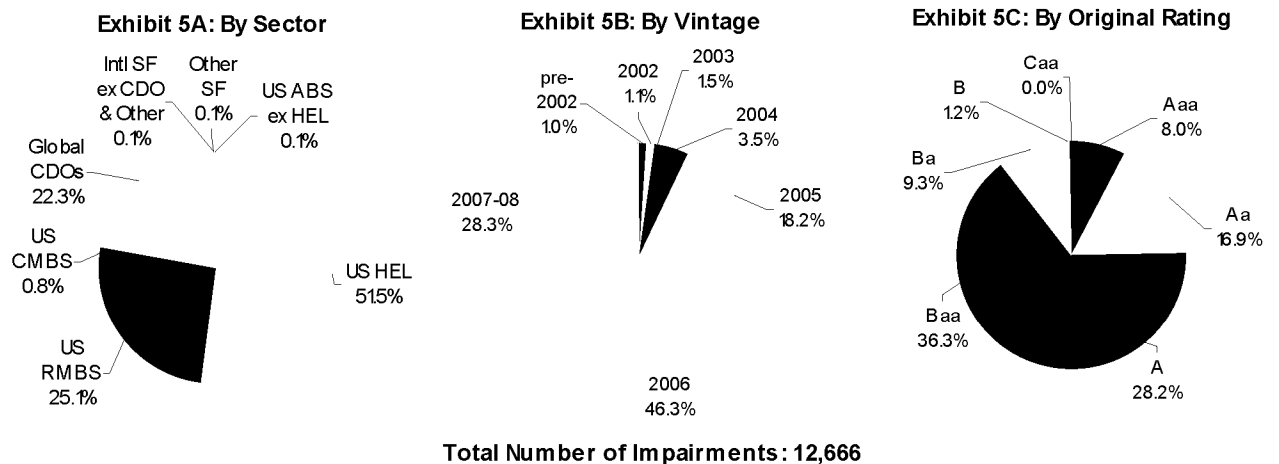
<sup>4</sup> Historically, interest shortfalls have had a much greater chance of being cured than principal losses and thus, we distinguish between interest impaired securities and principal impaired securities due to the difference in the stability of its impairment status.

**Exhibit 4: Principal and Interest Impairments by Impairment Year**

| Impairment Year | Principal Impairments | Interest Impairments | Total Impairments |
|-----------------|-----------------------|----------------------|-------------------|
| 1994            | 3                     | 0                    | 3                 |
| 1995            | 1                     | 0                    | 1                 |
| 1996            | 17                    | 0                    | 17                |
| 1997            | 37                    | 0                    | 37                |
| 1998            | 25                    | 0                    | 25                |
| 1999            | 52                    | 2                    | 54                |
| 2000            | 50                    | 0                    | 50                |
| 2001            | 101                   | 2                    | 103               |
| 2002            | 269                   | 7                    | 276               |
| 2003            | 193                   | 16                   | 209               |
| 2004            | 228                   | 7                    | 235               |
| 2005            | 89                    | 1                    | 90                |
| 2006            | 101                   | 4                    | 105               |
| 2007            | 2,118                 | 23                   | 2,141             |
| 2008            | 12,425                | 241                  | 12,666            |

Exhibit 5 presents the distribution of 2008 material impairments by sector, vintage, and original rating. US HEL comprised the majority of impairments at 51% of the total, followed by US RMBS (25%) and global CDOs (22%). The remaining sectors made up only 1% of total impairments. The vintage distribution shows a similar concentration among the worst vintages, with the 2006 vintage comprising 46% of all impairments and the combined 2005-2008 vintages making up 93% of newly impaired securities.

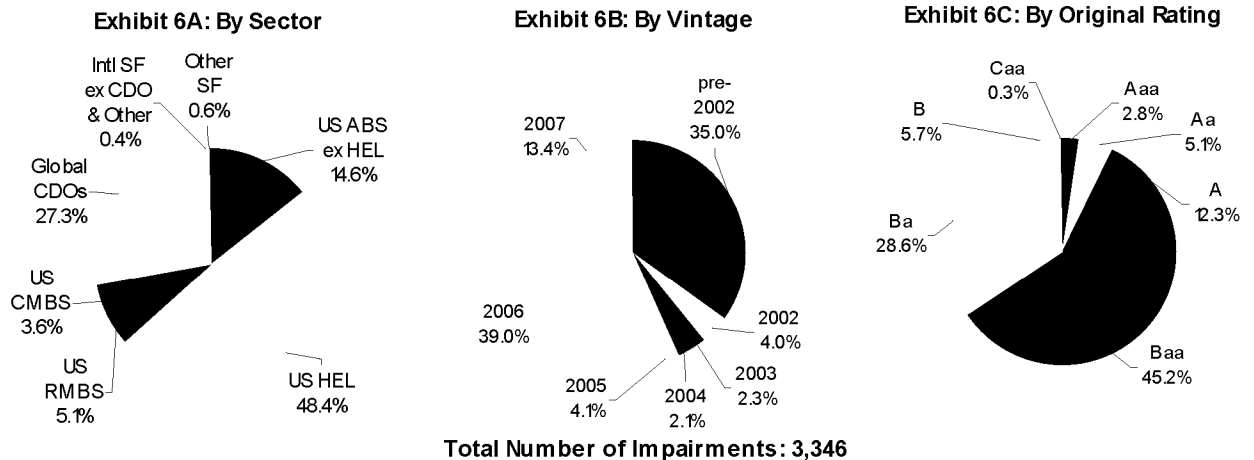
Approximately 90% of the 2008 impairments were originally rated investment grade, which was roughly in line with the percentage of investment grade ratings outstanding at the beginning of the year. Within the investment grade category, the share of material impairments declined as the rating category increased so that securities that were originally rated Baa contributed 36% to the total and Aaa contributed 8%.

**Exhibit 5: Distribution of Material Impairments in 2008**

These same segmentations are broken out for impairments prior to 2008 and show that the impairment experience prior to 2008 is very different from that in 2008 (Exhibit 6). While US HEL still made up roughly half of the impairments prior to 2008, US RMBS contributed only 5% and US ABS ex HEL accounted for a much larger proportion of impairments historically than it did in 2008. As in 2008, the 2006 vintage was the major contributor to impairments prior to 2008, but deals that closed prior to 2002 were the second largest contributor. In addition, securities that were originally rated speculative grade made up 35% of the

impairments between 1993 and 2007 versus 11% in 2008 and the higher rating categories (Aaa, Aa, and single-A) were a much smaller share of overall impairments.

### Exhibit 6: Distribution of Material Impairments prior to 2008



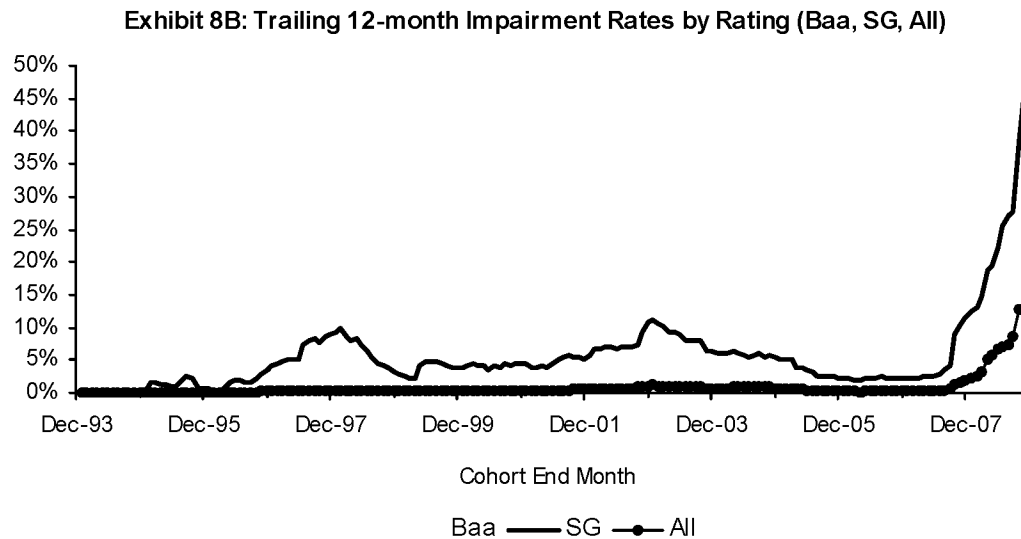
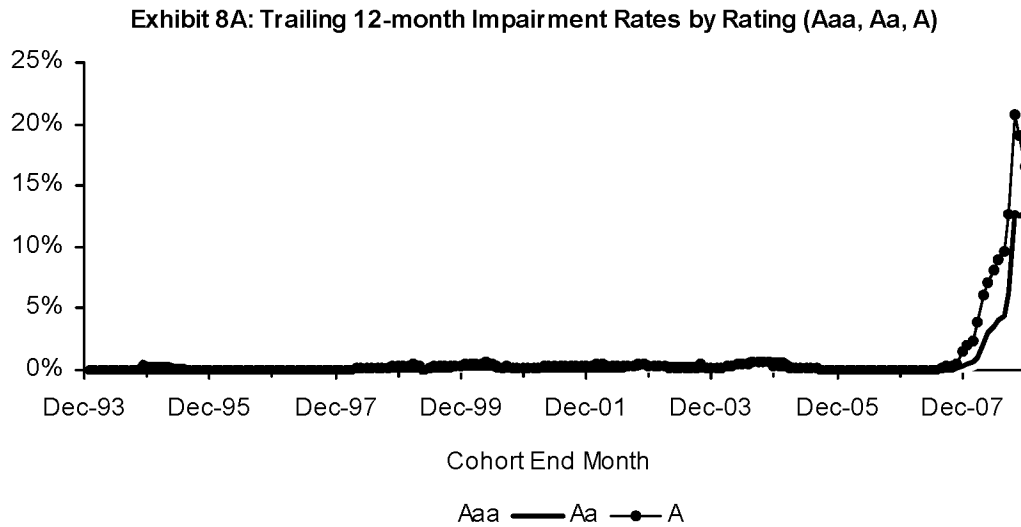
The distribution of impairments by sector and impairment year is shown in greater detail in Exhibit 7. For US HEL, US RMBS, global CDOs, and International Structured Finance, excluding CDOs and the Other category, there were more impairments in 2008 than in the prior 15 years combined. Of the 16 impairments occurring in 2008 in the International SF category, there were 9 Mexican construction loan securitizations, 2 notes from an Australian equipment lease transaction, and 2 classes of a German RMBS deal. In addition, one tranche each from a Spanish ABS deal, Spanish RMBS deal, and Italian CMBS transaction became impaired in 2008. For the Other Structured Finance category, 16 SIVs and 2 derivative product companies contributed to the 18 impairments in the sector.

### Exhibit 7: Material Impairments by Impairment Year and Sector

| Impairment Year | US ABS ex HEL | US HEL       | US RMBS      | US CMBS    | Global CDOs  | Intl SF ex CDO & Other | Other SF  | Total         |
|-----------------|---------------|--------------|--------------|------------|--------------|------------------------|-----------|---------------|
| 1994            | 0             | 0            | 0            | 3          | 0            | 0                      | 0         | 3             |
| 1995            | 0             | 1            | 0            | 0          | 0            | 0                      | 0         | 1             |
| 1996            | 0             | 12           | 5            | 0          | 0            | 0                      | 0         | 17            |
| 1997            | 0             | 28           | 9            | 0          | 0            | 0                      | 0         | 37            |
| 1998            | 4             | 19           | 2            | 0          | 0            | 0                      | 0         | 25            |
| 1999            | 12            | 34           | 4            | 2          | 2            | 0                      | 0         | 54            |
| 2000            | 15            | 17           | 6            | 0          | 12           | 0                      | 0         | 50            |
| 2001            | 29            | 12           | 5            | 5          | 52           | 0                      | 0         | 103           |
| 2002            | 117           | 13           | 4            | 17         | 118          | 7                      | 0         | 276           |
| 2003            | 99            | 30           | 3            | 23         | 54           | 0                      | 0         | 209           |
| 2004            | 144           | 13           | 7            | 20         | 49           | 2                      | 0         | 235           |
| 2005            | 18            | 21           | 8            | 20         | 23           | 0                      | 0         | 90            |
| 2006            | 32            | 25           | 7            | 22         | 18           | 1                      | 0         | 105           |
| 2007            | 20            | 1,393        | 110          | 8          | 586          | 3                      | 21        | 2,141         |
| 2008            | 17            | 6,519        | 3,174        | 97         | 2,825        | 16                     | 18        | 12,666        |
| <b>Total</b>    | <b>507</b>    | <b>8,137</b> | <b>3,344</b> | <b>217</b> | <b>3,739</b> | <b>29</b>              | <b>39</b> | <b>16,012</b> |

The pattern of rising impairments, particularly among the investment grade rating categories, can also be seen in Exhibit 8, which plots the time series of trailing 12-month impairment rates.<sup>5</sup> Impairment rates hit all-time highs for all rating categories in 2008.

### Exhibit 8: Trailing 12-month Impairment Rates by Cohort Rating



Transactions that closed between 2005 and 2007 accounted for 85% of all historical impairments, reflecting the poorly performing US HEL, US RMBS, and global CDOs from these vintages (Exhibit 9). The 2006 vintage has the highest share of impairments at 45% and has experienced the poorest performance to date, with roughly one quarter of ratings issued that year impaired as of the end of 2008. The 2007 vintage was second in terms of greatest number of impairments and highest cumulative impairment rate.

<sup>5</sup> Note that the 12-month impairment rates provided in this table and throughout the report do not take into account those newly impaired securities that were issued in 2008 as the last cohort was formed at the beginning of 2008.

**Exhibit 9: Structured Finance Material Impairments by Closing Year, 1993-2008**

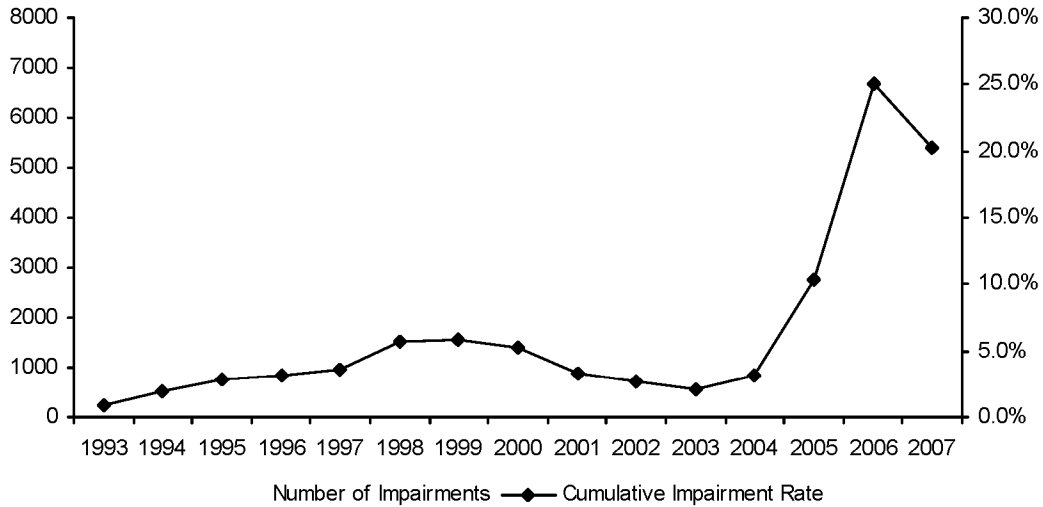
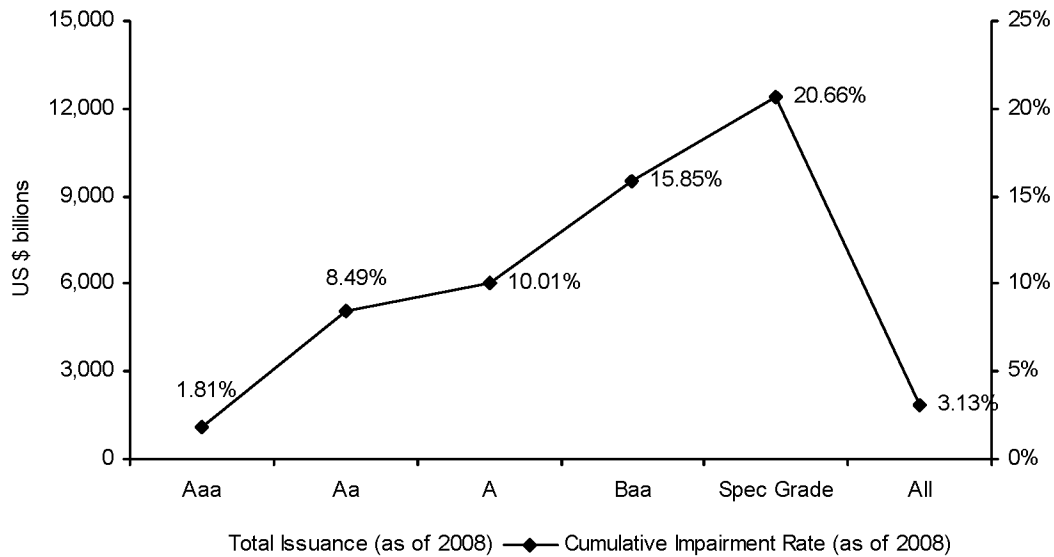


Exhibit 10 presents cumulative structured finance issuance by broad rating category and shows cumulative impairment rates by volume.<sup>6</sup> It illustrates that the vast majority of issuance by volume (86%) has been originally rated Aaa. Aa, single-A, and Baa issuance represent 5%, 4%, and 3% shares of total historical issuance, respectively, while speculative grade issuance is less than 1% of all structured volume.

**Exhibit 10: Cumulative Material Impairment Rate by Original Rating and Volume**



Cumulative impairment rates increased across all rating categories in 2008 relative to the rates at the end of 2007. However, impairment rates are still rank-ordered by rating with securities originally rated Aaa experiencing the lowest frequency of lifetime impairments to date and tranches issued with speculative grade ratings the highest.

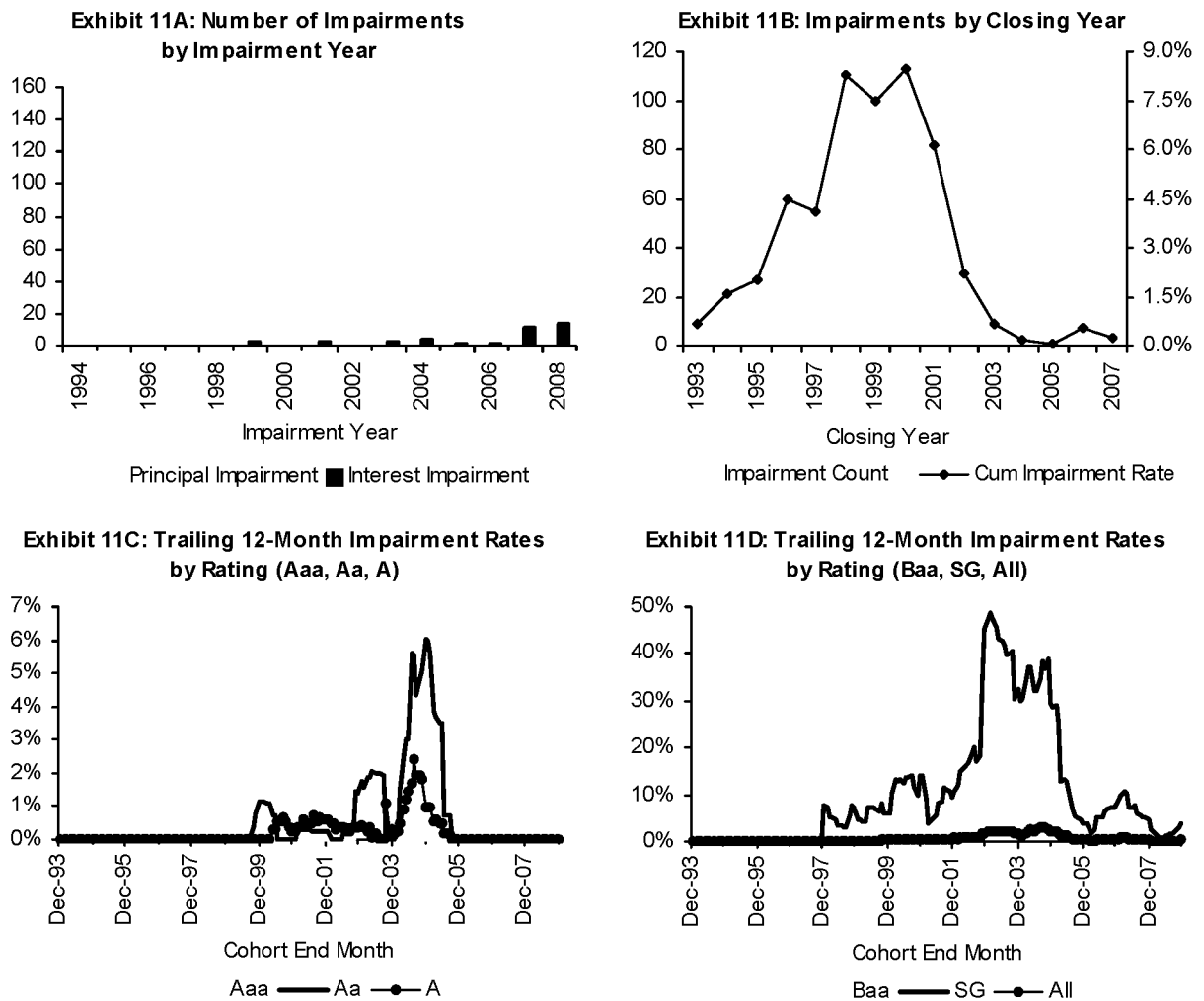
<sup>6</sup> The Other Structured Finance category is excluded from the volume calculations in Exhibit 10 as historical issuance in this category is not as well catalogued.

## Sector Specific Analysis of Impairments

### US ABS ex HEL

US ABS, excluding HEL, was the only major sector in which the number of impairments declined from 2007 to 2008 (Exhibit 11). Moreover, only 3 of the 17 impairments that occurred in 2008 were principal impairments and the 12-month impairment rate for the Aaa, Aa, and single-A rating categories has been zero for the last 3 years.

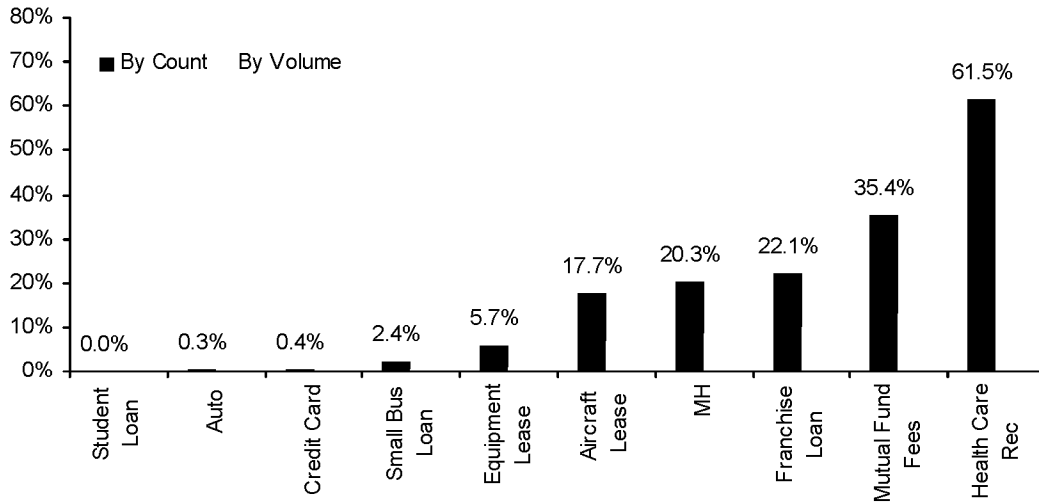
**Exhibit 11: US ABS ex HEL Material Impairment Trends**



Ten of the 17 US ABS ex HEL impairments in 2008 were backed by small business loans, three were backed by franchise loans, and two were backed by equipment leases. The remaining two transactions were backed by mutual fund fees and recreational vehicle loans.

Exhibit 12 shows the cumulative impairment rate experienced by select sub-sectors within US ABS and reveals that the three major asset classes – student loans, autos, and credit cards – have experienced few impairments through year-end 2008. However, judging by the amount of downgrade activity that has occurred in 2009 so far, these sectors have experienced performance deterioration which may lead to higher impairment rates in the future.

**Exhibit 12: Cumulative Impairment Rates for US ABS by Asset Type, 1993-2008**

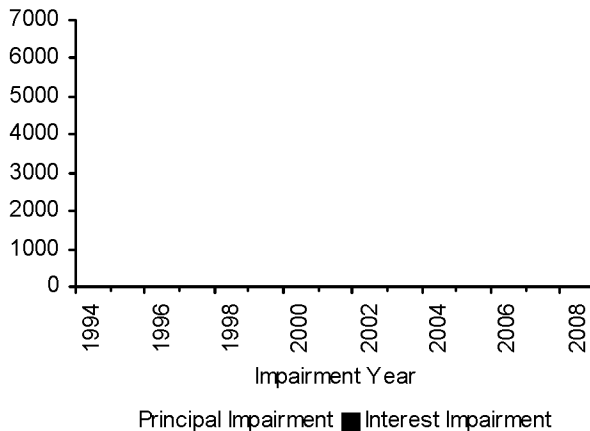


## US HEL & RMBS

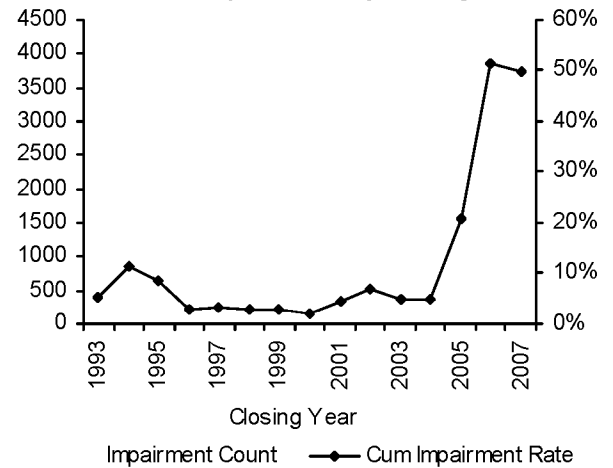
The collapse of the US housing market continued to negatively impact the performance of US HEL as the number of material impairments rose to 6,519 in 2008 (Exhibit 13). Impairments reached up the capital structure of securitizations to impact even highly-rated tranches as the 12-month impairment rate increased for all rating categories. Over 80% of US HEL securities that were rated below investment grade at the beginning of 2008 were impaired by the end of the year. Predictably, impairments have been concentrated in the 2005 to 2007 vintages with the 2006 vintage accounting for roughly half of all US HEL impairments.

**Exhibit 13: US HEL Material Impairment Trends**

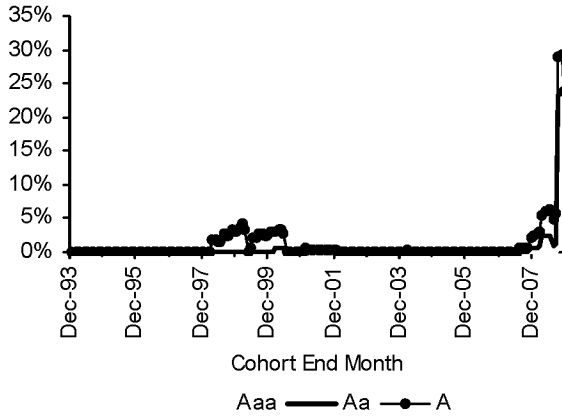
**Exhibit 13A: Number of Impairments by Impairment Year**



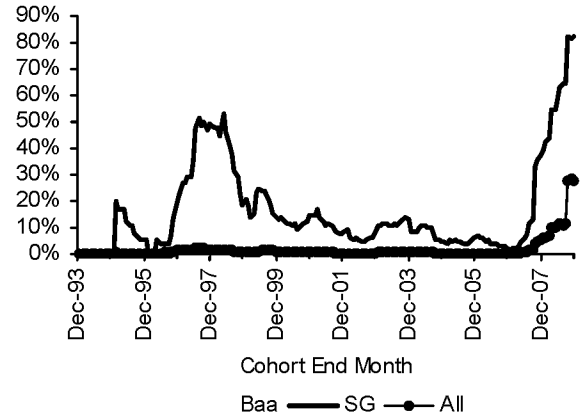
**Exhibit 13B: Impairments by Closing Year**



**Exhibit 13C: Trailing 12-Month Impairment Rates by Rating (Aaa, Aa, A)**



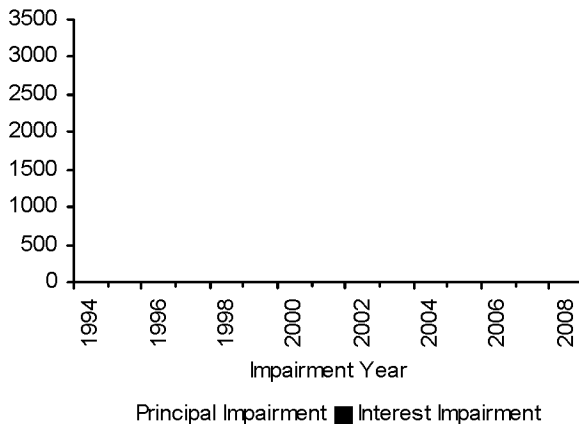
**Exhibit 13D: Trailing 12-Month Impairment Rates by Rating (Baa, SG, All)**



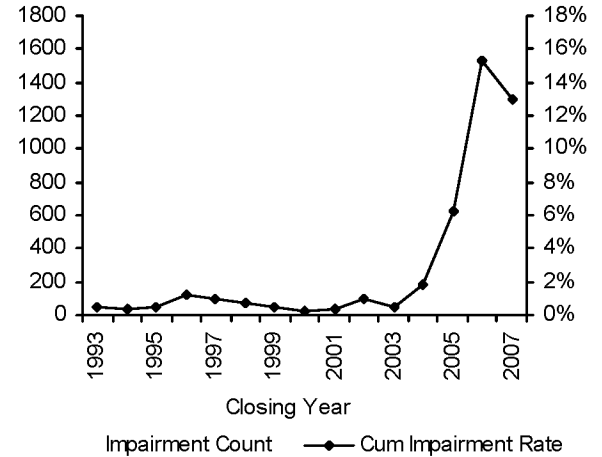
US RMBS experienced a similar trend as US HEL as the deterioration of the US residential housing market and rising unemployment affected borrowers across the credit spectrum. The sector saw a considerable increase in the number of impairments (3,174) and in the 12-month impairment rate for all ratings (Exhibit 14).

**Exhibit 14: US RMBS Material Impairment Trends**

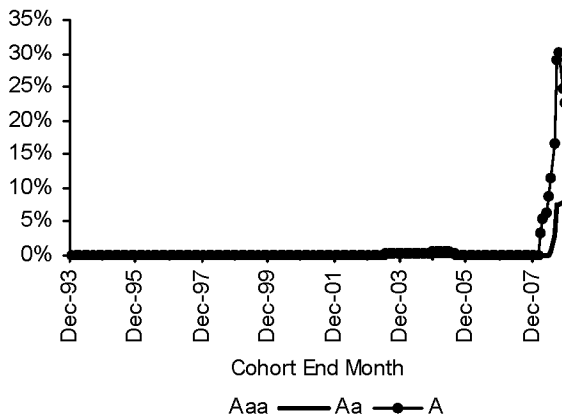
**Exhibit 14A: Number of Impairments by Impairment Year**



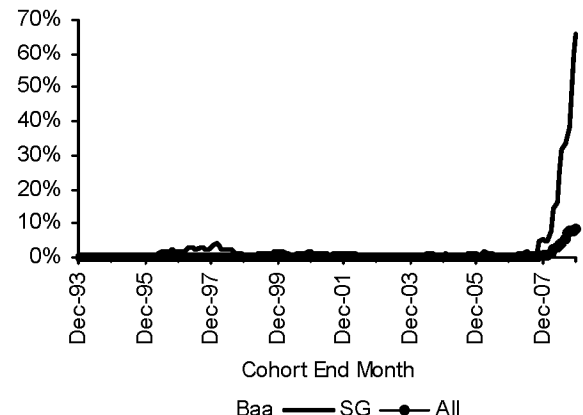
**Exhibit 14B: Impairments by Closing Year**



**Exhibit 14C: Trailing 12-Month Impairment Rates by Rating (Aaa, Aa, A)**



**Exhibit 14D: Trailing 12-Month Impairment Rates by Rating (Baa, SG, All)**

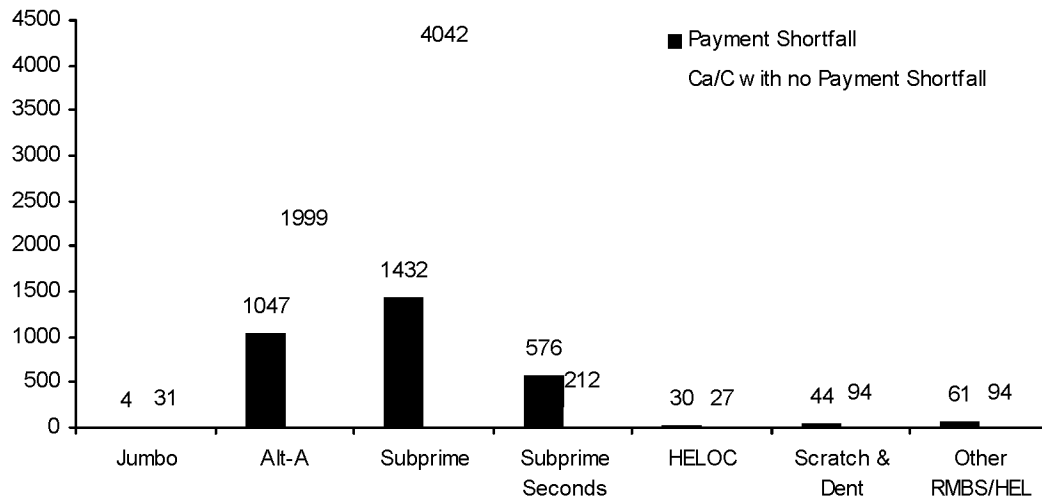




Also like US HEL, US RMBS impairments have been dominated by securities from the 2005 to 2007 vintages (93%), with particular emphasis on tranches issued in 2006 (48%).

Further analysis of the 2008 US RMBS and HEL impairments reveals that the largest number of impairments involved securities backed by subprime first liens, followed by Alt-A<sup>7</sup> transactions, and then subprime seconds (Exhibit 15).<sup>8</sup> There were relatively few transactions backed by jumbo mortgages that were impaired. Furthermore, most impairments came about as a result of a downgrade to Ca/C rather than actual payment shortfalls.<sup>9</sup>

**Exhibit 15: US RMBS/HEL Impairments in 2008 by Loan Type**



Impairment statistics for the vintages (2005 to 2007) and loan types (subprime firsts, subprime seconds, and Alt-A) that have experienced the largest number of impairments are broken out by rating category in Exhibit 16 to Exhibit 18. Of the three loan types, subprime seconds have experienced the worst performance to date with 78% of the ratings issued between 2005 and 2007 impaired as of the end of 2008. Securities backed by first-lien subprime and Alt-A mortgages have also performed poorly, but have experienced much fewer impairments among Aaa-rated securities. The 2005 vintage has seen the best performance, while the 2006 and 2007 vintages have comparably high impairment rates.

**Exhibit 16: Impairments among US RMBS/HEL Backed By Subprime First Lien Mortgages as of year-end 2008**

| Original Rating | Impaired   | Rated        | % Impaired   | Impaired      | Rated          | % Impaired  |
|-----------------|------------|--------------|--------------|---------------|----------------|-------------|
| Aaa             | 0          | 2,112        | 0.0%         | 0             | 347,456        | 0.0%        |
| Aa              | 12         | 1,010        | 1.2%         | 211           | 36,369         | 0.6%        |
| A               | 115        | 1,034        | 11.1%        | 2,043         | 19,572         | 10.4%       |
| Baa             | 568        | 1,100        | 51.6%        | 7,442         | 13,703         | 54.3%       |
| Ba              | 291        | 341          | 85.3%        | 3,010         | 3,348          | 89.9%       |
| B               | 1          | 1            | 100.0%       | 7             | 7              | 100.0%      |
| <b>Total</b>    | <b>987</b> | <b>5,598</b> | <b>17.6%</b> | <b>12,713</b> | <b>420,457</b> | <b>3.0%</b> |

<sup>7</sup> The Alt-A category here includes Option ARMs.

<sup>8</sup> Resecuritizations are classified as Other RMBS/HEL even if the securities serving as collateral were themselves backed by jumbo, Alt-A, first-lien subprime, etc. mortgages.

<sup>9</sup> The impairment status of the tranche is as of December 2008, but the payment shortfall status is updated as of January 2009.

| Original Rating | Impaired | Rated | % Impaired | Impaired | Rated   | % Impaired |
|-----------------|----------|-------|------------|----------|---------|------------|
| Aaa             | 6        | 2,131 | 0.3%       | 296      | 349,292 | 0.1%       |
| Aa              | 541      | 1,281 | 42.2%      | 16,547   | 41,260  | 40.1%      |
| A               | 1,056    | 1,311 | 80.5%      | 17,524   | 21,375  | 82.0%      |
| Baa             | 1,259    | 1,308 | 96.3%      | 14,558   | 15,005  | 97.0%      |
| Ba              | 449      | 451   | 99.6%      | 4,502    | 4,512   | 99.8%      |
| B               | 0        | 0     | NA         | 0        | 0       | NA         |
| Total           | 3,311    | 6,482 | 51.1%      | 53,426   | 431,443 | 12.4%      |

| Original Rating | Impaired | Rated | % Impaired | Impaired | Rated   | % Impaired |
|-----------------|----------|-------|------------|----------|---------|------------|
| Aaa             | 6        | 1,060 | 0.6%       | 226      | 143,498 | 0.2%       |
| Aa              | 359      | 649   | 55.3%      | 9,726    | 18,018  | 54.0%      |
| A               | 547      | 625   | 87.5%      | 7,887    | 8,830   | 89.3%      |
| Baa             | 555      | 580   | 95.7%      | 6,218    | 6,424   | 96.8%      |
| Ba              | 121      | 124   | 97.6%      | 1,274    | 1,296   | 98.3%      |
| B               | 1        | 1     | 100.0%     | 12       | 12      | 100.0%     |
| Total           | 1,589    | 3,039 | 52.3%      | 25,344   | 178,078 | 14.2%      |

### Exhibit 17: Impairments among US RMBS/HEL Backed By Subprime Second Lien Mortgages as of year-end 2008

| Original Rating | Impaired | Rated | % Impaired | Impaired | Rated  | % Impaired |
|-----------------|----------|-------|------------|----------|--------|------------|
| Aaa             | 0        | 110   | 0.0%       | 0        | 14,508 | 0.0%       |
| Aa              | 41       | 100   | 41.0%      | 785      | 2,197  | 35.7%      |
| A               | 95       | 115   | 82.6%      | 1,055    | 1,395  | 75.6%      |
| Baa             | 141      | 144   | 97.9%      | 1,134    | 1,162  | 97.5%      |
| Ba              | 65       | 65    | 100.0%     | 444      | 444    | 100.0%     |
| B               | 0        | 0     | NA         | 0        | 0      | NA         |
| Total           | 342      | 534   | 64.0%      | 3,418    | 19,707 | 17.3%      |

| Original Rating | Impaired | Rated | % Impaired | Impaired | Rated  | % Impaired |
|-----------------|----------|-------|------------|----------|--------|------------|
| Aaa             | 70       | 181   | 38.7%      | 9,913    | 23,644 | 41.9%      |
| Aa              | 175      | 179   | 97.8%      | 3,473    | 3,480  | 99.8%      |
| A               | 181      | 183   | 98.9%      | 1,838    | 1,845  | 99.6%      |
| Baa             | 208      | 209   | 99.5%      | 1,452    | 1,455  | 99.8%      |
| Ba              | 99       | 99    | 100.0%     | 670      | 670    | 100.0%     |
| B               | 0        | 0     | NA         | 0        | 0      | NA         |
| Total           | 733      | 851   | 86.1%      | 17,345   | 31,094 | 55.8%      |

| Original Rating | Impaired | Rated | % Impaired | Impaired | Rated  | % Impaired |
|-----------------|----------|-------|------------|----------|--------|------------|
| Aaa             | 20       | 64    | 31.3%      | 1,945    | 8,924  | 21.8%      |
| Aa              | 41       | 45    | 91.1%      | 530      | 661    | 80.2%      |
| A               | 55       | 56    | 98.2%      | 555      | 562    | 98.7%      |
| Baa             | 57       | 58    | 98.3%      | 454      | 462    | 98.4%      |
| Ba              | 18       | 18    | 100.0%     | 204      | 204    | 100.0%     |
| B               | 0        | 0     | NA         | 0        | 0      | NA         |
| Total           | 191      | 241   | 79.3%      | 3,688    | 10,812 | 34.1%      |

**Exhibit 18: Impairments among US RMBS/HEL Backed By Alt-A Mortgages as of year-end 2008**

| Original Rating | Impaired | Rated | % Impaired | Impaired | Rated   | % Impaired |
|-----------------|----------|-------|------------|----------|---------|------------|
| Aaa             | 2        | 4,968 | 0.0%       | 3        | 373,489 | 0.0%       |
| Aa              | 23       | 931   | 2.5%       | 378      | 13,591  | 2.8%       |
| A               | 143      | 572   | 25.0%      | 1,565    | 5,618   | 27.9%      |
| Baa             | 317      | 629   | 50.4%      | 2,080    | 3,906   | 53.3%      |
| Ba              | 73       | 110   | 66.4%      | 371      | 566     | 65.6%      |
| B               | 13       | 23    | 56.5%      | 38       | 68      | 56.2%      |
| Total           | 571      | 7,233 | 7.9%       | 4,436    | 397,237 | 1.1%       |

| Original Rating | Impaired | Rated | % Impaired | Impaired | Rated   | % Impaired |
|-----------------|----------|-------|------------|----------|---------|------------|
| Aaa             | 4        | 4,854 | 0.1%       | 34       | 368,063 | 0.0%       |
| Aa              | 222      | 1,318 | 16.8%      | 2,152    | 16,001  | 13.4%      |
| A               | 527      | 880   | 59.9%      | 3,206    | 5,331   | 60.1%      |
| Baa             | 650      | 810   | 80.2%      | 3,235    | 3,883   | 83.3%      |
| Ba              | 146      | 148   | 98.6%      | 704      | 710     | 99.2%      |
| B               | 14       | 14    | 100.0%     | 49       | 49      | 100.0%     |
| Total           | 1,563    | 8,024 | 19.5%      | 9,380    | 394,036 | 2.4%       |

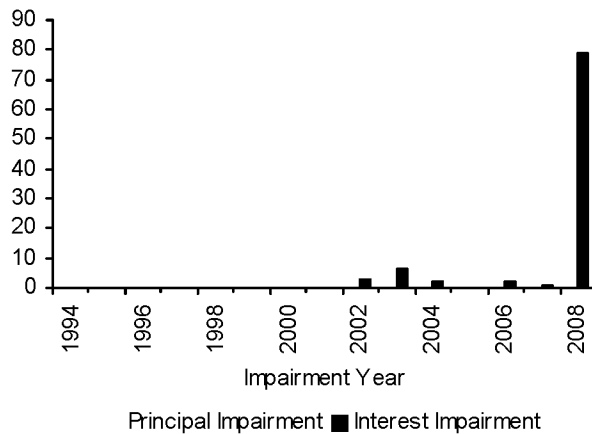
| Original Rating | Impaired | Rated | % Impaired | Impaired | Rated   | % Impaired |
|-----------------|----------|-------|------------|----------|---------|------------|
| Aaa             | 1        | 3,364 | 0.0%       | 27       | 223,465 | 0.0%       |
| Aa              | 145      | 998   | 14.5%      | 1,275    | 9,184   | 13.9%      |
| A               | 266      | 581   | 45.8%      | 1,392    | 2,850   | 48.8%      |
| Baa             | 365      | 514   | 71.0%      | 1,450    | 2,031   | 71.4%      |
| Ba              | 76       | 81    | 93.8%      | 413      | 432     | 95.5%      |
| B               | 18       | 18    | 100.0%     | 79       | 79      | 100.0%     |
| Total           | 871      | 5,556 | 15.7%      | 4,636    | 238,043 | 1.9%       |

## US CMBS

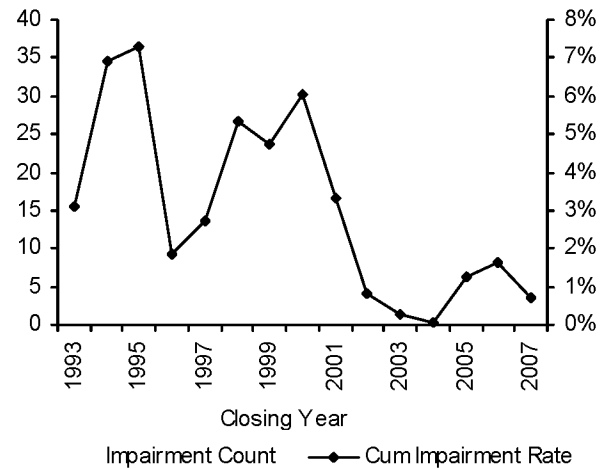
US CMBS<sup>10</sup> began to feel the effects of the weakening US commercial property market in 2008 as the number of impairments increased to 97 from 8 in 2007 (Exhibit 19). However, 81% of those impairments were interest impairments and US CMBS has historically had a significant cure rate for securities that experienced only interest shortfalls.<sup>11</sup> In addition, the 12-month US CMBS impairment rate remained zero for Aaa and Aa, as it has been for the last 13 years, and was below 1% for all investment grade rating categories. Securitizations that closed between 2005 and 2007 have underperformed for US CMBS as they have for US RMBS/HEL. The number of impairments from closing year 2006 has tied that of the 2000 vintage, which was historically, the worst-performing vintage. However, the proportion of securities from the 2005 to 2007 vintages that are impaired is still less than that of the 1998 to 2001 vintages.

**Exhibit 19: US CMBS Material Impairment Trends**

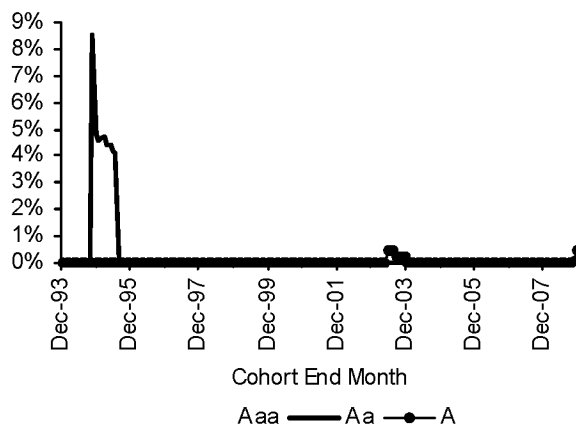
**Exhibit 19A: Number of Impairments by Impairment Year**



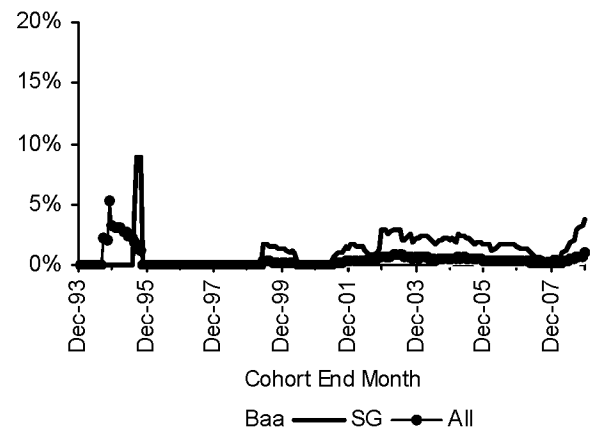
**Exhibit 19B: Impairments by Closing Year**



**Exhibit 19C: Trailing 12-Month Impairment Rates by Rating (Aaa, Aa, A)**



**Exhibit 19D: Trailing 12-Month Impairment Rates by Rating (Baa, SG, All)**



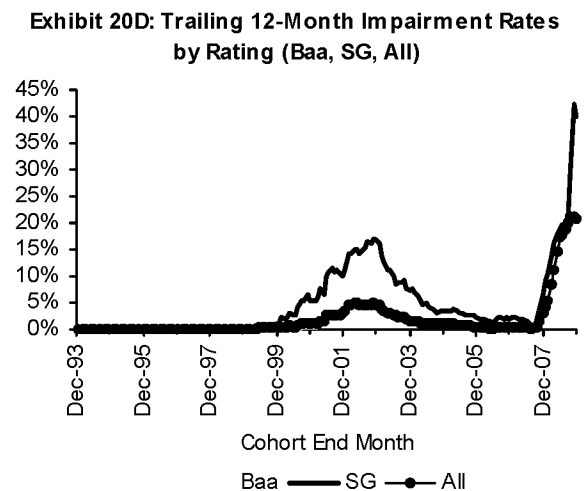
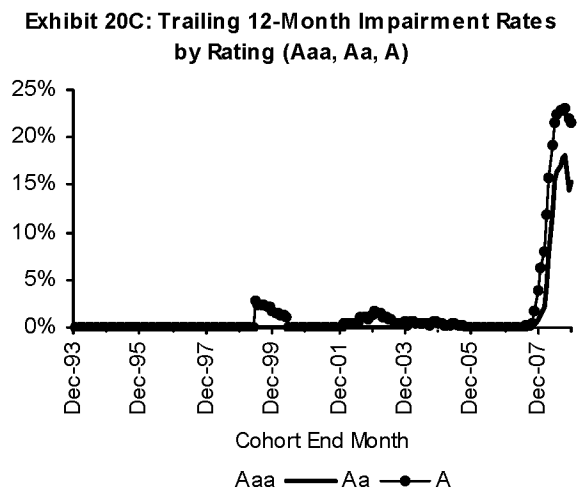
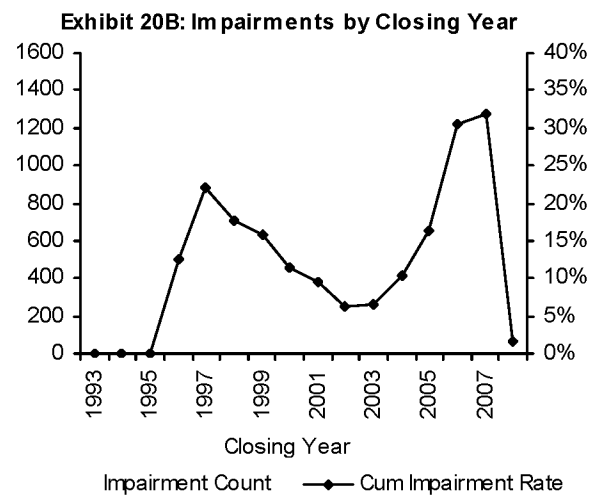
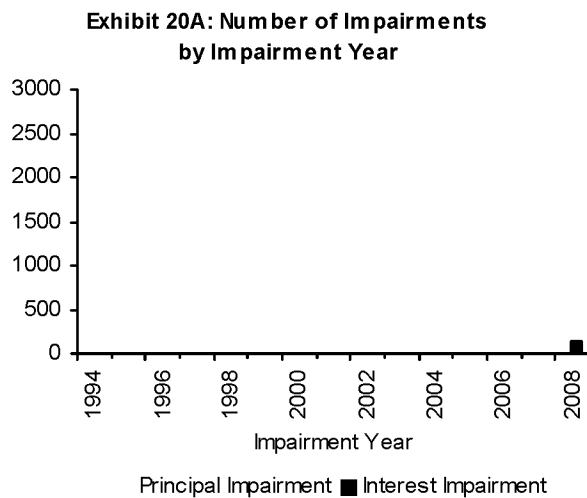
<sup>10</sup> Note that CRE CDOs are included in the US CMBS category.

<sup>11</sup> See Moody's Special Comment, "Default & Loss Rates of Structured Finance Securities: 1993-2005", April 2006.

## Global CDOs

Performance among global CDOs continued to worsen in 2008 with impairments reaching an all-time high of 2,825 (Exhibit 20). Unlike the US HEL and RMBS sectors, the 2007 vintage contributed a comparable number of impairments to the total count as the 2006 vintage.<sup>12</sup> The 12-month speculative-grade impairment rate, while high, was still lower than that of US RMBS/HEL. However, a larger percentage of highly-rated CDO securities were distressed as evidenced by the sharp increase in the 12-month impairment rates for Aaa- and Aa-rated securities.

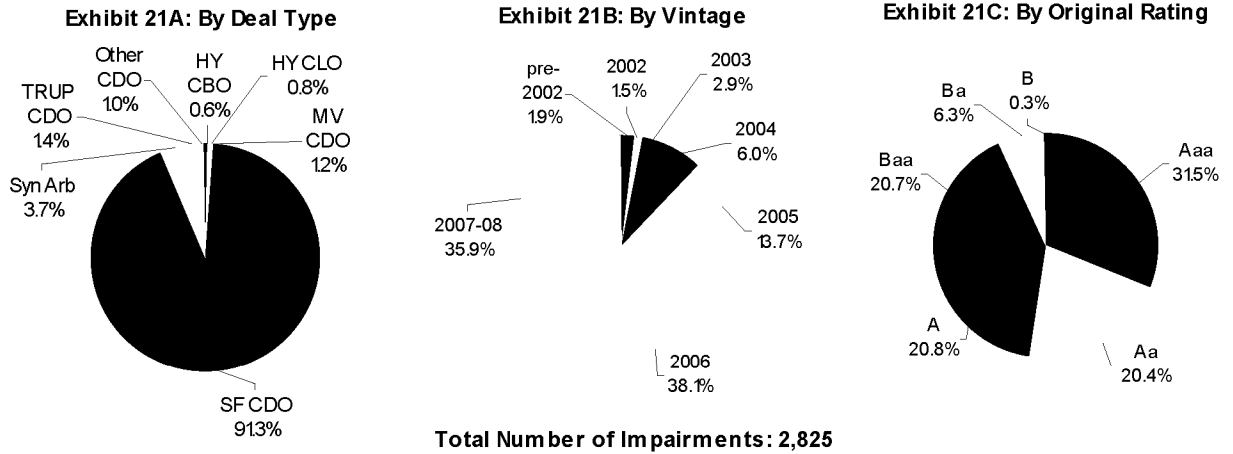
**Exhibit 20: Global CDO Material Impairment Trends**



Of the new impairments in CDOs, 91% involved SF CDOs (Exhibit 21). Synthetic arbitrage CDOs accounted for the second-largest percentage (3.7%), followed by TRUP CDOs (1.4%) and market value CDOs (1.2%). Less than 1% of 2008 impairments involved high-yield CLOs. The 2005 to 2008 vintages combined were responsible for 88% of the 2008 impairments. Securities originally rated Aaa accounted for the largest percentage of impairments, a reflection of both the large number of Aaa ratings issued and the very poor performance of the affected deals, since even the senior tranches have become impaired. Securities originally carrying Aa, single-A, and Baa ratings contributed roughly 20% each to the total number of impairments for the year.

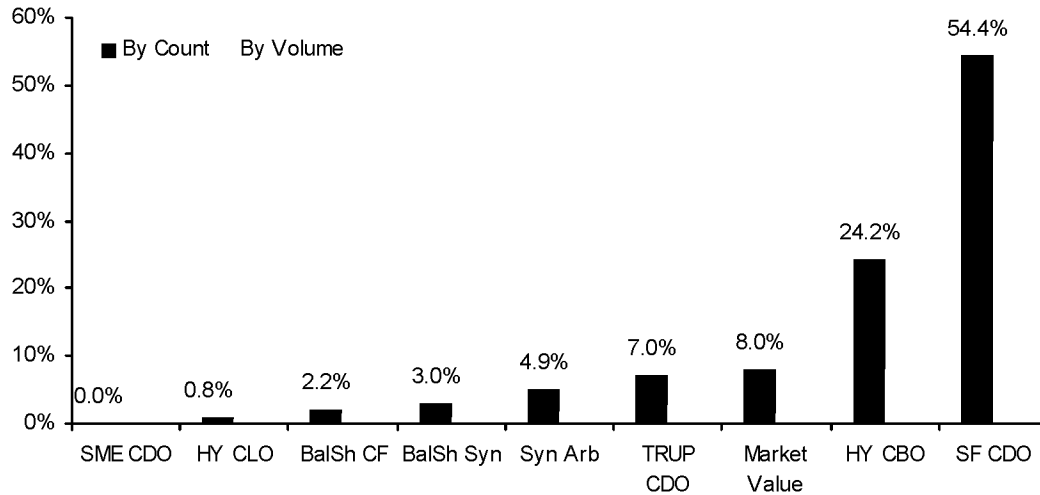
<sup>12</sup> The six impaired securities that were from the 2008 vintage, all had some exposure to Lehman Brothers Holdings Inc. and were affected by its bankruptcy filing in late 2008.

**Exhibit 21: Distribution of CDO Material Impairments in 2008**



SF CDOs have now overtaken HY CBOs as the CDO sub-sector with the highest cumulative impairment rate (Exhibit 22). In contrast, SME CDOs, HY CLOs, balance sheet cash flow CDOs (BalSh CF), and balance sheet synthetic CDOs (BalSh Syn) have experienced relatively low lifetime impairment rates to date.

**Exhibit 22: Cumulative Impairment Rates for Global CDOs by Deal Type, 1993-2008**



A more detailed breakdown of SF CDO impairments is displayed in Exhibit 23. As noted earlier, impairments have affected securities across the capital structure, up to and including the Aaa tranches of the transaction.

**Exhibit 23: Impairments for SF CDOs as of year-end 2008**

| Original Rating | Impaired    | Rated       | % Impaired   | Impaired     | Rated        | % Impaired   |
|-----------------|-------------|-------------|--------------|--------------|--------------|--------------|
| Aaa             | 906         | 2350        | 38.6%        | 208.8        | 525.0        | 39.8%        |
| Aa              | 597         | 1182        | 50.5%        | 25.9         | 61.0         | 42.4%        |
| A               | 657         | 1036        | 63.4%        | 17.2         | 32.8         | 52.5%        |
| Baa             | 801         | 1030        | 77.8%        | 15.1         | 21.3         | 70.9%        |
| Ba              | 255         | 314         | 81.2%        | 3.2          | 12.4         | 25.9%        |
| B               | 5           | 9           | 55.6%        | 1.4          | 1.4          | 96.5%        |
| <b>Total</b>    | <b>3221</b> | <b>5921</b> | <b>54.4%</b> | <b>271.6</b> | <b>654.0</b> | <b>41.5%</b> |

## Loss-Given-Default on Principal Impaired Tranches and Historical Average Loss Rates

This section presents analysis of loss severity rates, also known as loss-given-default (LGD) rates, and combines information on LGD rates with data on material impairment rates to derive cumulative loss rates.

Moody's regularly updates the payment and loss records of impaired structured finance securities. For each tranche, we calculate the present value of losses (to date) using the coupon rate as the discount rate. For many tranches, the loss rate to date is effectively the final loss severity because their outstanding balance is zero (called "resolved" impairments in this report). Many impaired tranches, however, have positive balances outstanding at the end of the study period and potential sources of future cash distributions to investors; hence, their expected final loss severity rates need to be estimated.

Estimating the final LGD on impaired structured finance securities is particularly challenging because losses accrue gradually over time for most securitizations and market prices are rarely available for distressed structured securities. In previous research, we developed models to estimate final LGD for impaired tranches backed by US residential mortgage pools, for ABS backed by manufactured housing loans, and for impaired cash-flow CDOs.<sup>13</sup> In this section we update these projections and derive estimated aggregate LGD rates by sector and by rating.

Although the majority of impaired structured securities are currently principal impaired, some are only experiencing interest shortfalls. Since there is a higher probability of cure and a greater challenge in forecasting losses for interest impaired tranches than principal impaired securities, we calculate and provide loss severity rates only for principal impairments in this report.

### LGD for All Resolved Principal Impairments

We first examine LGD for the 4,913 total impairments for which we have final resolved loss data. Recall that resolved impairments are defined as those impairments for which the principal balance is zero and the final losses known. Exhibit 24 contains both the mean and median LGD rates, stratified by broad rating category, as well as for the broader investment grade and speculative grade categories. Additionally, final LGD rates are computed by both original rating and rating at impairment, using the original balance and balance at the impairment date, respectively.

#### Exhibit 24: Realized Final LGD Rates by Rating for All Structured Finance Resolved Principal Impairments, 1993-2008

| Rating            | Counts | Mean  | Median | Std Dev | Rating            | Counts | Mean  | Median | Std Dev |
|-------------------|--------|-------|--------|---------|-------------------|--------|-------|--------|---------|
| Aaa               | 70     | 67.1% | 83.3%  | 32.4%   | Aaa               | 12     | 49.4% | 45.7%  | 42.8%   |
| Aa                | 301    | 85.2% | 91.0%  | 19.8%   | Aa                | 21     | 94.3% | 99.8%  | 21.1%   |
| A                 | 857    | 87.4% | 90.0%  | 12.4%   | A                 | 59     | 89.9% | 99.7%  | 20.3%   |
| Baa               | 2423   | 80.2% | 87.5%  | 21.2%   | Baa               | 620    | 96.2% | 99.7%  | 15.5%   |
| Ba                | 1129   | 79.5% | 85.9%  | 19.6%   | Ba                | 1122   | 96.9% | 99.7%  | 13.1%   |
| B                 | 127    | 61.7% | 71.9%  | 26.9%   | B                 | 1297   | 96.3% | 99.7%  | 14.8%   |
| Caa               | 6      | 73.5% | 75.1%  | 7.3%    | Caa               | 1782   | 98.3% | 99.8%  | 8.8%    |
| Investment Grade  | 3651   | 82.0% | 88.4%  | 20.0%   | Investment Grade  | 712    | 94.9% | 99.7%  | 18.0%   |
| Speculative Grade | 1262   | 77.7% | 85.4%  | 21.1%   | Speculative Grade | 4201   | 97.3% | 99.7%  | 12.1%   |
| All Ratings       | 4913   | 80.9% | 87.7%  | 20.4%   | All Ratings       | 4913   | 96.9% | 99.7%  | 13.1%   |

<sup>13</sup> See Moody's Special Comment, "Measuring Loss-Given-Default for Structured Finance Securities: An Update," December 2006.

On average, the present value of losses at origination for all resolved principal impaired securities increased to 81% in 2008, up from the 66% LGD rate reported in last year's study. Similarly, the LGD rate measured as the present value of losses as a percent of the impairment date balance rose to 97% from 86% in 2007. The sample of resolved impairments has increased substantially since last year and since 83% of the data set behind Exhibit 24 are now US HEL and RMBS impairments that closed between 2005 and 2007, the increase in loss severity reflects the high losses experienced by the underlying mortgage pools from those vintages. Many impaired tranches from these transactions have been written down completely, as evidenced by the median LGD rate of close to 100% when loss severity is calculated relative to the impairment date. However, as we have noted in prior reports, the average LGD of the sample of resolved impairments is expected to be higher than that of unresolved impairments because the very fact that the impaired security is resolved provides some information about the speed and severity of losses to the tranche. In particular, the resolved sample may contain a disproportionately large number of junior tranches since they are first in line to suffer write-downs.

Average LGD rates were not monotonic in rating, although the mean LGD of Aaa-rated securities was still smaller than that of all other ratings. Interestingly, by original rating, the loss severity rate for investment grade securities was higher than for speculative grade securities. Within a particular transaction, it is unlikely that a higher-rated tranche would have a larger LGD than a lower-rated tranche, but each rating category in the exhibit contains a different mix of transactions, asset classes, and vintages. For example, 60% of the resolved impairments originally rated Aa were backed by subprime second-lien mortgages, which have experienced very high losses, explaining in part the high mean LGD of 85% for this rating category. Conversely, impairments that originally carried a Baa rating have a lower average LGD rate of 80% and only 15% of this sample was backed by subprime seconds.

Average LGD rates calculated using the impairment date as the reference date were generally much higher than those computed as of the closing date, owing mainly to discounting. Mean loss severity at impairment was above 89% for all rating categories, excluding Aaa. The distribution of LGD was skewed as median loss severities exceed mean loss severities for almost all groupings, with median severities at impairment date close to 100% for all categories except Aaa.

### **Exhibit 25: Realized Final LGD Rates by Sector for Resolved Principal Impairments by Asset Class, 1993-2008**

| <b>Asset Class</b>      | <b>Counts</b> | <b>Mean</b> | <b>Counts</b> | <b>Mean</b> |
|-------------------------|---------------|-------------|---------------|-------------|
| US ABS ex HEL           | 151           | 66.8%       | 57            | 72.3%       |
| Franchise Loans         | 15            | 74.7%       | 14            | 81.3%       |
| Health Care Receivables | 24            | 77.0%       | 0             | NA          |
| Manufactured Housing    | 95            | 66.6%       | 35            | 75.0%       |
| US RMBS/HEL             | 3348          | 83.2%       | 1144          | 79.0%       |
| Alt-A                   | 933           | 86.9%       | 209           | 81.6%       |
| HELOC                   | 28            | 89.3%       | 10            | 87.0%       |
| Scratch & Dent          | 31            | 76.9%       | 16            | 74.8%       |
| Subprime Firsts         | 1499          | 77.9%       | 686           | 78.1%       |
| Subprime Seconds        | 819           | 89.5%       | 186           | 85.1%       |
| US CMBS                 | 9             | 24.5%       | 36            | 62.4%       |
| Global CDOs             | 143           | 74.6%       | 25            | 53.9%       |
| HY CBOs                 | 22            | 44.6%       | 11            | 58.1%       |
| SF CDOs                 | 111           | 84.4%       | 5             | 74.7%       |

Exhibit 25 contains mean LGD rates as a percentage of the original balance for broad asset classes and select sub-asset classes. In general, LGD rates varied more widely across sectors than by rating class with US



CMBS experiencing the lowest average severity rate and US RMBS/HEL the highest. For US ABS ex HEL and US CMBS, LGD rates for securities originally rated investment grade were lower than their speculative grade counterparts, while the opposite is true for global CDOs and US RMBS/HEL.

Not surprisingly, impaired tranches backed by HELOCs and subprime seconds have so far fared worse than securities backed by first-lien residential mortgages. Impaired Alt-A tranches have experienced higher LGD rates on average than impaired securitizations of first-lien subprime mortgages, but this may be due to the higher concentration of the poorly performing 2005-2007 vintages in the sample of Alt-A impairments (98%) relative to subprime firsts (86%). Within the CDO sector, resolved HY CBOs had lower severity rates than resolved SF CDOs.

## LGD for Principal Impaired US RMBS/HEL Tranches

Exhibit 26 aggregates LGD rates for a combined sample of principal impairments among US RMBS and HEL that have either resolved or for which we have estimated final LGD using our LGD projection model. There were 4,948 impairments in this larger sample, of which 4,492 were resolved principal impairments.

Since resolved US RMBS and HEL principal impairments were the primary contributors to both Exhibits 24 and 26, their LGD distributions are very similar. In fact, the average for investment-grade ratings, speculative-grade ratings, and all ratings combined in the table below were virtually identical to those in Exhibit 24. The only significant difference was a lower estimated LGD for Aaa-rated impairments.

### Exhibit 26: Estimated LGD Rates by Rating for a Combined Sample of Resolved and Unresolved US RMBS/HEL Principal Impairments, 1993-2008

| Rating            | Counts | Mean  | Median | Std Dev | Rating            | Counts | Mean  | Median | Std Dev |
|-------------------|--------|-------|--------|---------|-------------------|--------|-------|--------|---------|
| Aaa               | 38     | 42.4% | 44.1%  | 29.1%   | Aaa               | 3      | 4.6%  | 4.6%   | 1.2%    |
| Aa                | 282    | 87.5% | 90.9%  | 14.8%   | Aa                | 21     | 93.4% | 99.7%  | 21.3%   |
| A                 | 893    | 87.5% | 89.8%  | 11.4%   | A                 | 34     | 88.3% | 99.8%  | 25.9%   |
| Baa               | 2506   | 80.2% | 87.3%  | 21.0%   | Baa               | 595    | 95.1% | 99.7%  | 17.3%   |
| Ba                | 1132   | 79.3% | 85.9%  | 19.8%   | Ba                | 1199   | 96.2% | 99.7%  | 13.1%   |
| B                 | 97     | 57.8% | 67.4%  | 28.7%   | B                 | 1356   | 96.5% | 99.7%  | 12.5%   |
| Caa               | 0      | NA    | NA     | NA      | Caa               | 1740   | 98.3% | 99.8%  | 8.3%    |
| Investment Grade  | 3719   | 82.1% | 88.2%  | 19.5%   | Investment Grade  | 653    | 94.3% | 99.7%  | 19.0%   |
| Speculative Grade | 1229   | 77.6% | 85.5%  | 21.4%   | Speculative Grade | 4295   | 97.2% | 99.7%  | 11.2%   |
| All Ratings       | 4948   | 81.0% | 87.6%  | 20.1%   | All Ratings       | 4948   | 96.8% | 99.7%  | 12.6%   |

## LGD for Principal Impaired CDO Tranches

There were 168 resolved principal impaired CDO tranches in our sample. For an additional 454 securities, we projected final LGD rates using a model developed for cash-flow CDOs. Exhibit 27 summarizes the results of this combined sample.

Aaa-rated CDO impairments were projected to have much higher LGD rates than their counterparts in US RMBS and HEL, but for almost all other rating categories, estimated average severity rates were lower. However, the results in Exhibit 27 must be interpreted with caution for the following two reasons. 73% of the CDO data sample were LGD forecasts and are therefore inexact and may change over time. In contrast, 91% of the data set used for US RMBS/HEL were final realized LGD rates involving no projection and thus, are fixed. In addition, because we were not able to derive final LGD estimates for most principal impaired SF CDOs, the percentage of SF CDOs in the sample underlying Exhibit 27 was less than that of the overall population of CDO principal impairments. Therefore, the averages presented here may not accurately represent the average final LGD of the entire population of CDO impairments.

## Exhibit 27: Estimated LGD Rates by Rating for a Combined Sample of Resolved and Unresolved CDO Principal Impairments, 1993-2008

| Rating            | Counts | Mean  | Median | Std Dev | Rating            | Counts | Mean  | Median | Std Dev |
|-------------------|--------|-------|--------|---------|-------------------|--------|-------|--------|---------|
| Aaa               | 49     | 76.4% | 88.1%  | 28.4%   | Aaa               | 12     | 49.4% | 45.7%  | 42.8%   |
| Aa                | 59     | 79.2% | 90.3%  | 27.3%   | Aa                | 10     | 98.3% | 98.4%  | 1.1%    |
| A                 | 149    | 87.9% | 90.1%  | 7.8%    | A                 | 85     | 97.6% | 99.3%  | 6.1%    |
| Baa               | 272    | 73.4% | 79.6%  | 20.4%   | Baa               | 185    | 92.1% | 97.8%  | 14.2%   |
| Ba                | 70     | 64.1% | 71.2%  | 22.2%   | Ba                | 128    | 94.8% | 99.6%  | 13.0%   |
| B                 | 23     | 58.1% | 63.8%  | 21.3%   | B                 | 121    | 90.1% | 98.9%  | 20.4%   |
| Caa               | 0      | NA    | NA     | NA      | Caa               | 81     | 92.0% | 100.0% | 18.2%   |
| Investment Grade  | 529    | 78.4% | 87.1%  | 20.6%   | Investment Grade  | 292    | 92.2% | 98.5%  | 17.1%   |
| Speculative Grade | 93     | 62.6% | 68.9%  | 22.0%   | Speculative Grade | 330    | 92.4% | 99.4%  | 17.3%   |
| All Ratings       | 622    | 76.0% | 85.1%  | 21.5%   | All Ratings       | 622    | 92.3% | 98.9%  | 17.2%   |

## LGD for Principal Impaired US ABS ex HEL Tranches

Among US ABS ex HEL, there were 208 resolved principal impairments. We obtained final LGD estimates for 102 impaired tranches backed by manufactured housing loans (MH) using a projection method designed specifically for MH. Exhibit 28 contains descriptive LGD rate statistics computed using realized final LGD rates from resolved impaired US ABS tranches and predicted loss severity for unresolved MH principal impairments. In all, three-quarters of this sample were impaired manufactured housing ABS.

## Exhibit 28: Estimated LGD Rates by Rating for a Combined Sample of Resolved and Unresolved US ABS Principal Impairments, 1993-2008

| Rating            | Counts | Mean  | Median | Std Dev | Rating            | Counts | Mean  | Median | Std Dev |
|-------------------|--------|-------|--------|---------|-------------------|--------|-------|--------|---------|
| Aaa               | 14     | 60.4% | 65.2%  | 15.7%   | Aaa               | 0      | NA    | NA     | NA      |
| Aa                | 47     | 59.1% | 61.6%  | 23.5%   | Aa                | 6      | 75.6% | 78.2%  | 19.5%   |
| A                 | 47     | 61.8% | 66.2%  | 17.3%   | A                 | 26     | 73.7% | 75.0%  | 16.4%   |
| Baa               | 135    | 54.3% | 55.9%  | 21.4%   | Baa               | 62     | 86.7% | 96.2%  | 22.5%   |
| Ba                | 58     | 70.9% | 79.3%  | 20.9%   | Ba                | 83     | 87.7% | 96.2%  | 19.5%   |
| B                 | 9      | 74.5% | 80.6%  | 20.5%   | B                 | 66     | 79.9% | 90.5%  | 23.9%   |
| Caa               | 0      | NA    | NA     | NA      | Caa               | 67     | 86.1% | 91.2%  | 16.6%   |
| Investment Grade  | 243    | 57.0% | 61.4%  | 20.9%   | Investment Grade  | 94     | 82.4% | 93.4%  | 21.4%   |
| Speculative Grade | 67     | 71.4% | 79.7%  | 20.8%   | Speculative Grade | 216    | 84.9% | 94.0%  | 20.4%   |
| All Ratings       | 310    | 60.1% | 65.1%  | 21.7%   | All Ratings       | 310    | 84.1% | 94.0%  | 20.7%   |

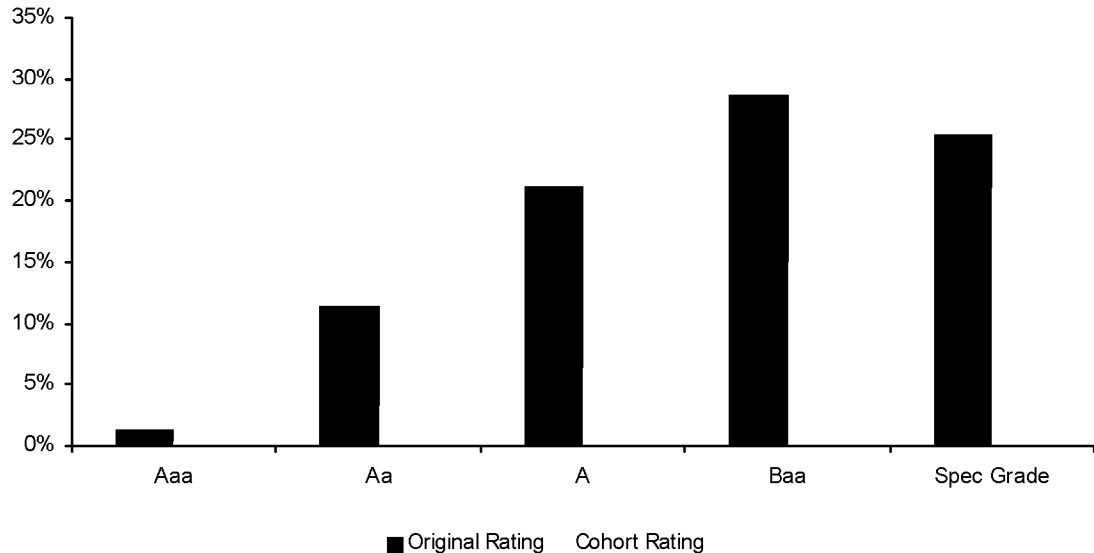
Computed as a percent of original balance, the average LGD rate of 60% for US ABS ex HEL principal impairments was well below the mean for US RMBS/HEL and global CDOs. The same relationship holds true for severity rates calculated as of the impairment date. While LGD rates were not monotonic in rating, impaired securities that were originally rated speculative grade had a higher mean LGD (71%) than those originally rated investment grade (57%). Although the mean loss severity of Aaa principal impairments was roughly as high as the rates for other investment grade ratings, the sample was small and mostly consisted of ABS backed by health care receivables from one issuer.

## Historical Average Multi-Year Loss Rates

Multi-year cumulative loss rates are the weighted average of marginal loss rates, which we compute using marginal principal impairment and LGD rates.<sup>14</sup> As in previous studies, we use sector specific LGD and impairment rates to calculate cumulative loss rates.<sup>15</sup>

Exhibit 29 shows five-year cumulative loss rates by both original and cohort rating. Detailed multi-year cumulative loss rates by rating, horizon, and sector appear in Appendix IV.

**Exhibit 29: Structured Finance Five-Year Cumulative Loss Rates by Rating, 1993-2008**



From Exhibit 29, we note the following:

Five-year cumulative loss rates have increased considerably from those reported last year because of the significant growth in the number of material impairments in 2008.

By cohort rating, estimated cumulative loss rates increased monotonically as ratings fell. This was also true for investment grade ratings by original rating, but securities originally rated speculative grade had a lower estimated 5-year loss rate than securities originally rated Baa. However, the number of speculative grade ratings issued was much smaller than for Baa and therefore, their loss rates can be more volatile. Furthermore, securities that carry below investment grade ratings at origination are much more common in some sectors (e.g. US CMBS) than in others (e.g. US RMBS) and thus their performance will be influenced by a different blend of asset types.

Unlike prior studies, five-year cumulative loss rates by original rating were significantly higher than those by cohort rating. Loss rates computed by cohort rating average the performance of monthly cohorts of outstanding ratings formed between 1993 and the beginning of 2008. Although the most recent cohorts have high estimated loss rates, there are many older cohorts with lower losses, mitigating the effect of the cohorts formed within the last year. In addition, as long as a rating is outstanding, it will be part of the monthly cohort and will continue to be counted in the calculation. Therefore, a more seasoned security will contribute more to the loss rate by cohort rating than an unseasoned security. In contrast, each security contributes only once to the calculation of the marginal loss rate by original rating. Since issuance was much higher between 2005 and 2007 than in other years, loss rates for original ratings are heavily weighted toward these poorly performing vintages.

<sup>14</sup> See Appendix II for a more detailed discussion of how multi-year cumulative loss rates are calculated.

<sup>15</sup> This is the first study for which we use only US CMBS loss severity data for the US CMBS sector rather than supplementing with information from other mortgage related sectors (e.g. US RMBS/HEL).

## Appendix I: Description of Data Sample and Glossary

The data sample used in this report includes all public, 144A, and private tranches with a published Moody's long-term global debt rating among global asset-backed securities (ABS), commercial and residential mortgage-backed securities (CMBS and RMBS), collateralized debt obligations (CDOs), and other structured finance, including asset backed commercial paper (ABCP), structured investment vehicles (SIVs), structured covered bonds, catastrophe bonds, and derivative product companies. Provisional ratings, credit estimates or evaluations, short-term ratings, and national scale ratings are not included. The following types of securities are excluded from the definition of global structured finance and therefore are not included in the data sample: repackaged securities, structured notes, and other credit derivatives which are basically pass-throughs of the rating of another entity. In addition, the data sample only contains securities issued since 1993.

This data set is an expansion of the data set that was used in prior structured finance default and loss studies.<sup>16</sup> In particular, this data sample:

- Includes tranches wrapped by financial guarantors, government agencies, and government sponsored enterprises (GSEs);

- Includes interest-only (IO) and residual tranches;

- Includes some transactions outside of the four major sectors (ABS, CDO, CMBS, RMBS) of structured finance, such as ABCP, SIVs, structured covered bonds, catastrophe bonds and derivative product companies;

- Does not collapse tranches with the same rating from the same deal, i.e. all pari-passu tranches are counted in the data sample. The exceptions to this are notes with the same rating issued out of the same program for ABCP, SIVs and structured covered bonds, in which case only the rating of the program and not each individual security is counted.

*The data used to create this report are commercially available via Moody's Structured Finance Default Risk service. For more information, please email [DefaultResearch@moodys.com](mailto:DefaultResearch@moodys.com).*

## Glossary

---

### Payment Shortfall

Structured finance securities are defined as having a payment shortfall (previously called "payment default") if they have experienced either one of the following:

- Interest shortfall, or

- Principal write-down/loss.

Reductions in interest paid that arise due to prepayments of principal on the underlying loans or due to limitations imposed by "available funds caps" (AFC) are not considered to be interest shortfalls. On the other hand, "payment-in-kind" (PIK) events, in which the interest payment is deferred and capitalized into the balance, are treated as interest shortfalls, regardless of whether or not it is described as a default event in the bond's indenture. Explicit principal write-downs are included whereas implicit principal write-downs or under-collateralizations are not.

### Material Impairment

Structured finance securities are defined as being in material impairment if they have:

- Sustained a payment shortfall that has not been cured, or

- Been downgraded to Ca or C, and hence is expected to suffer a significant level of payment losses in the future.

<sup>16</sup> The expanded data sample was first introduced in our 2007 rating transitions studies.

The impairment status of a security may change as it goes from cured (i.e. all outstanding shortfalls and losses were repaid in full) to uncured (i.e. positive interest shortfalls or principal losses outstanding), or vice versa. If a security downgraded to Ca or C, but not in payment shortfall, is subsequently upgraded, then it is no longer in material impairment. Securities downgraded to Ca or C that are not upgraded are in material impairment even if their payment shortfalls have been cured. Finally, securities with very minor shortfalls or losses are excluded.

### **Principal Impairment**

This refers to materially impaired securities that have experienced principal write-downs or principal losses, or have been downgraded to Ca or C even if a principal write-down or loss has not yet been observed. In particular, if a security has experienced principal write-down/loss or was downgraded to Ca or C, it is called a principal impairment regardless of whether it has experienced interest shortfalls.

### **Interest Impairment**

This refers to materially impaired securities that have experienced only interest shortfalls, no principal losses, and were not downgraded to Ca or C.

### **Resolved and Unresolved Impairments**

A materially impaired security is "resolved" in the sense that its principal balance has been reduced to zero, or "unresolved" in the sense that it has a positive principal balance outstanding as of the end of the study period. These were called matured and non-matured defaults in prior studies.

### **Investment Grade (IG) and Speculative Grade (SG) Ratings**

Investment grade ratings refer to Aaa, Aa1, Aa2, Aa3, A1, A2, A3, Baa1, Baa2, and Baa3. Speculative grade or below investment grade ratings refer to Ba1, Ba2, Ba3, B1, B2, B3, Caa1, Caa2, Caa3, Ca, and C.

### **12-Month Impairment Rate**

This is the number of securities that became impaired within a 12-month period after a cohort formation date divided by the number of securities outstanding at the cohort formation date, minus one half the number of the ratings withdrawn over the 12 months after the cohort was formed. Cohorts are formed at the beginning of each month.

### **Marginal Impairment Rate**

For a cohort of securities outstanding (or issued if by original rating) at the beginning of year  $t$ , the  $N$ -th year marginal impairment rate is the number of securities newly impaired in year  $(t+N)$  divided by the total number of securities that survived to that year, minus one half the number of the survived securities that were withdrawn during the year. Securities that are impaired or withdrawn before the year have not survived, and therefore do not appear in the denominator of this rate.

### **Lifetime Impairment Rate**

This is the total number of impaired securities divided by the total number of securities issued over a particular time period without regard to the time horizon of impairments.

### **Multi-year Cumulative Impairment Rate**

This is one minus the multi-year cumulative survival rate, which is the product of the marginal survival rates in each year within the multi-year horizon. The marginal survival rate is one minus the marginal impairment rate.

### **Loss Severity or Loss-Given-Default (LGD)**

The LGD rate of an impaired structured finance security is measured as the sum of the present values of net losses, including both interest shortfalls and principal losses, discounted by the security's coupon rate and

expressed as a percentage of a given principal balance such as the principal balance at origination, at the impairment date, or at any given cohort date.

## Multi-Year Cumulative Loss Rate

This is the product of the multi-year cumulative impairment rate and multi-year average LGD rate. The multi-year average LGD rate is estimated using the final loss severity rate of impaired securities, for which final LGD is known or can be estimated, after taking into account the uncertainty of impairment timing.

## ABS ex HEL

ABS stands for asset-backed securities. This structured finance sector includes securities backed by both traditional asset types such as auto loans, credit card receivables, student loans, and manufactured housing loans, and non-traditional asset types such as mutual fund fees, tax liens, tobacco settlement payments, and intellectual property. Home equity loans (HEL) are explicitly excluded from US ABS ex HEL.

## HEL

The home equity loan or HEL sector includes securities backed by subprime (B&C) mortgage loans, home improvement loans, high loan-to-value (high LTV) loans, home equity lines of credit (HELOCs), and closed-end second-lien loans, as well as net interest margin (NIM) securitizations. It does not include securities backed by Alt-A mortgages, which are included in the RMBS sector. HEL is part of the ABS sector.

Prior to 1998, RMBS collateral was generally defined as first-lien residential mortgages, regardless of the credit quality of the borrower. HEL collateral generally included junior liens such as HELOCs or closed-end seconds. However, as subprime lending became more prevalent, the market shifted its definition such that HEL encompassed subprime first-lien residential mortgages while RMBS included first-lien mortgages made to higher quality borrowers. Since 1998, a deal classified as RMBS by Moody's is generally backed by prime or Alt-A quality first-lien residential mortgages, while a deal classified as HEL is generally backed by subprime first-lien mortgages or junior liens. Therefore, a subprime deal which would be classified as HEL today may have been classified as RMBS in the past.

## RMBS

RMBS stands for residential mortgage-backed securities. The vast majority of these securities are backed by first-lien prime mortgages or by Alt-A mortgages. For further details, see the definition of HEL.

## CMBS

CMBS stands for commercial mortgage-backed securities. Commercial real estate (CRE) CDOs, where 70% or more of the collateral is comprised of CRE loans, are classified as CMBS. If the collateral backing the transaction contains less than 70% CRE loans, then the deal is classified as a CDO.

## CDOs

CDOs stand for collateralized debt obligations. Derivative securities such as structured notes and repackaged securities are not considered to be part of this sector. Commercial real estate (CRE) CDOs, where 70% or more of the collateral is comprised of CRE loans, are classified as CMBS. If the collateral backing the transaction contains less than 70% CRE loans, then the deal is classified as a CDO. CDO deal types include:

- Balance sheet cash flow CDOs (BalSh CF)
- Balance sheet synthetic CDOs (BalSh Syn)
- High yield collateralized bond obligations (HY CBO)
- High yield collateralized loan obligations (HY CLO)
- Market value CDOs (MV)
- Small to medium size enterprise CDOs (SME CDO)

Synthetic arbitrage CDOs (Syn Arb)

Trust preferred securities CDOs (TRUP CDO)

Structured finance CDOs (SF CDO)

### **Other Structured Finance**

Other structured finance consists of structured finance securities not categorized in the five major sectors (ABS ex HEL, HEL, RMBS, CMBS, and CDO) including asset-backed commercial paper (ABCP) programs, structured investment vehicles (SIVs), structured covered bonds, insurance-linked securities such as catastrophe bonds, and derivative product companies. However, notes carrying only short-term ratings such as commercial paper are excluded.

### **Global Structured Finance**

Global structured finance captures securities issued around the world in the five major sectors - ABS ex HEL, HEL, RMBS, CMBS, and CDO – and in the Other Structured Finance category.

### **US Structured Finance**

US structured finance securities are denominated in US dollars and issued in the US market or denominated in Canadian dollars and issued in Canada. In cases where the source of the underlying collateral and the denomination of the securities cross multiple countries/regions, deals are classified by the location at which they are monitored.

### **EMEA Structured Finance**

EMEA is an abbreviation of Europe, the Middle East, and Africa. EMEA structured finance securities are denominated in a currency from or issued out of a country in the EMEA region. In cases where the source of the underlying collateral and the denomination of the securities cross multiple countries/regions, deals are classified by the location at which they are monitored.

### **Intl Structured Finance**

This refers to securities that are not denominated in US dollars and issued in the US market and not denominated in Canadian dollars and issued in Canada. The majority of the securities in this sector are issued in Europe, the Middle East, and Africa (EMEA); the rest are issued in the Asia Pacific region and Latin America.

## Appendix II: Calculating Multi-Year Material Impairment and LGD Rates

### Cumulative Impairment Rate by Cohort Rating

The methodology for computing the multi-year cumulative impairment rate for structured finance securities is the same as the one used in Moody's corporate issuer default studies. The denominator of the marginal impairment rate in a given period (e.g. one year) is adjusted to reflect tranches whose ratings were withdrawn or impaired prior to that period. Such an adjustment implies that future impairments can only occur to tranches that have survived to that point in time and cannot occur to tranches that have already been impaired or withdrawn. Rating cohorts are formed each month to construct cumulative impairment rates.

The cumulative impairment rate for a time horizon  $T$  is calculated as:

$$D(T) = 1 - \prod_{t=1}^T (1 - d_t)$$

Where  $d_t$  is the marginal impairment rate:

$$d_t = \frac{x_t}{n_t - w_t / 2}$$

And where  $x_t$  is the number of impairments in year  $t$ ,  $w_t$  is the number of rating withdrawals in year  $t$ , and

$$n_t = n_{t-1} - x_{t-1} - w_{t-1}$$

The variable  $n_t$  is the number of tranches that survive into the cohort at time  $t$ . When the horizon  $T$  is equal to 1, the cumulative impairment rate and the marginal impairment rate are equal. Note that in addition to removing the prior-year withdrawals from the denominator, one-half of the withdrawals in time  $t$  are also removed. This adjustment accounts for the fact that the withdrawn securities were likely not outstanding for the entire time period and assumes that the timing of withdrawals within a given period is uniformly distributed.

Let us now look at an example, assuming all securities are carrying the same rating in both 2004 and 2005.

#### An Example for Calculating Cumulative Impairment Rates

| Number of Securities Issued | Impaired | Withdrawn | Number of Securities Outstanding | Impaired | Withdrawn |
|-----------------------------|----------|-----------|----------------------------------|----------|-----------|
| 200                         | 10       | 95        | 95                               | 5        | 90        |

In the example, the average first-year marginal impairment rate is  $(10+5)/(200+95-95/2-90/2)$ , or 7.41%. The second-year marginal impairment rate is  $5/(95-90/2)=10\%$ .<sup>17</sup> The average marginal survival rates are 92.6% and 90.0% in the first and second year, respectively. The average two-year cumulative survival rate is the

<sup>17</sup> There are two first-year cohorts in this example – one formed at the beginning of 2004 and the other formed at the beginning of 2005. However, there is only one second-year cohort – the observations in 2005 of the two-year cohort that is formed at the beginning of 2004.



product of the two survival rates:  $92.6\% \times 90.0\% = 83.3\%$ . Therefore, the average two-year cumulative impairment rate is one minus the survival rate:  $100\% - 83.3\% = 16.7\%$ .

Moody's believes that this method of calculating cumulative impairment rates provides the most relevant information to investors who want to look at the historical impairment experience when evaluating the risk of an investment with any particular expected maturity. There are, however, at least two other approaches found in the literature, which tend to produce lower impairment rates and/or fail to use all available information.

One similar approach calculates the marginal impairment rates without adjusting for withdrawals, hence,  $n_t = n_{t-1} - x_{t-1}$ . Applying this methodology to the above example reduces the second year marginal impairment rate to  $5/(95+95-90/2) = 3.45\%$ . The average two-year cumulative impairment rate then becomes  $(1-7.41\%)(1-3.45\%) = 10.6\%$ . Not adjusting for withdrawals inflates the survival rate and thus, lowers the cumulative impairment rate.

Another approach calculates cumulative impairment rates by treating impairment as a separate "rating" category (note that Moody's does not have a "D" or default rating category). For a given time horizon, ratings transition frequencies are calculated using only ratings observations at the beginning and the end of the time horizon. Newly issued ratings that have not spanned the entire time horizon are not included. For example, if additional securities are issued at the beginning of 2005, the impairment experience of those securities would not be included in a two-year impairment rate calculation. Therefore, this methodology is limited, for it does not fully utilize all available, relevant data.

## Cumulative Impairment by Original Rating

As in previous structured finance default studies, we calculate impairment rates for both cohort and original ratings using essentially the same method. We caution that the comparison and interpretation of the impairment rates by these two types of ratings are different depending on sector and sample period. The following example illustrates the contrast.

### ***An Example Showing the Difference between Cohort-Based Impairment Rates and Origination-Based Impairment Rates***

| Number of Securities Issued and Their Rating | Impaired | Withdrawn | Distribution of Outstanding Securities by Rating   | Impaired | Withdrawn |
|--|----------|-----------|--|----------|-----------|
| 100, rated Baa                               | 0        | 0         | 95, remain Baa rated;<br>5, downgraded to single-B | 0        | 95        |
| 100, rated single-B                          | 0        | 0         | 100, remain single-B                               | 5        | 95        |

In the example, 100 Baa-rated and 100 single-B rated securities are issued at the beginning of 2004. By the end of 2004, 95 of the 100 Baa-rated securities have not changed their ratings and five securities are downgraded to single-B. At the end of 2005, the 95 stable ratings are withdrawn and the 5 downgraded ratings become impaired. The single-B ratings issued in the beginning of 2004 experience no rating changes, impairments, or withdrawals in 2004. However, in 2005, five of them become impaired and the rest (95 securities) are withdrawn.

Based on cohort ratings, the first-year marginal impairment rate in the Baa category is 0% since no impairments are observed on securities rated Baa in 2004 or 2005. The second year marginal impairment rate for Baa is  $5/(100-95/2) = 9.5\%$ . (This statistic is based solely on the performance in 2005 of the 100 Baa-rated securities issued in 2004). Hence, the two-year cumulative impairment rate in the Baa rating category is 9.5%.

By original rating, the two-year cumulative impairment rate for the Baa rating category is also  $5/(100-95/2)=9.5\%$ . The Baa sample and performance are the same by original rating or cohort rating. In the single-B category, however, there are significant differences.

For the single-B rating category, the average first-year marginal impairment rate by cohort rating is  $(0+5+5)/(100+100+5-95/2)=6.35\%$ . Note that there are three first-year cohorts for single-B, and both the numerator and denominator include the five single-B securities, which were initially rated Baa at the beginning of 2004. The second-year marginal impairment rate by cohort rating is  $5/(100-95/2)=9.5\%$ . Therefore, the average two-year cumulative impairment rate is  $1-(1-6.35\%)*(1-9.5\%)=15.25\%$ .

However, by original rating, the first-year single-B marginal impairment rate is 0% because there are no impairments in 2004. The second-year marginal impairment rate is 9.5%, which is the same rate as that by cohort rating. This implies that the two-year cumulative impairment rate by original rating for single-B is 9.5%, which is substantially lower than the cumulative impairment rate of 15.25% by cohort rating.

The large difference between the single-B two-year impairment rates by original rating and cohort rating is due to the treatment of the five securities initially rated Baa at the beginning of 2004 but downgraded to single-B at the beginning of 2005. If the performance of these downgraded single-B's is worse than the original single-B's, then the cohort-rating based impairment rates will be higher than the original-rating based impairment rates. Conversely, if the performance of these downgraded single-B's is better, the cohort-rating based impairment rates will be lower instead.

## Multi-Year Cumulative LGD Rates

When not all loss severity rates on impaired securities are available, direct calculation of the cumulative loss rate is not possible. In these cases, we rely on the concept of multi-year cumulative LGD rate, which is a weighted average of marginal loss severity rates. Suppose that we know the average loss severity as a percentage of the cohort-date balance (also known as "marginal loss severity rates") of single-B rated securities both one and two years before they default. The average loss severity rates of the single-B rated securities that default within two years (either in year 1 or year 2) is calculated by taking the weighted average of the one-year and two-year marginal severity rates. The weights are attributable to each year and are shares of the two-year cumulative default rates. The following is a concrete example:

### *An Example for Calculating a Two-Year Cumulative LGD Rate*

| Number of Securities Issued | Impaired    | Withdrawn | Number of Outstanding Securities | Impaired    | Withdrawn |
|-----------------------------|-------------|-----------|----------------------------------|-------------|-----------|
| 100                         | 5 (LGD=30%) | 0         | 95                               | 6 (LGD=50%) | 89        |

In this example, there are five impairments in the first year, and all have a loss severity rate of 30% as a share of their balance at the beginning of 2004. Six securities are impaired in the second year, and all have a loss severity rate of 50%, which is expressed as a share of the principal balance at the beginning of 2004 – the two-year cohort-date balance. Note that in order to compute a two-year cumulative LGD rate, all marginal LGD rates need to be expressed as a share of the cohort date balance with appropriate discounting.

In the example, the one-year impairment rate is 5%, and the two-year cumulative impairment rate is  $1-(1-5\%)*(1-6/(95-89/2))$ , or 16.3%. The two-year cumulative LGD rate is:  $(5\%*30\%+11.3\%*50\%)/16.3\%=43.9\%$ , which measures the average LGD rate over a two-year period, assuming no knowledge about the timing of impairments at the beginning of 2004.

Thus, the two-year cumulative loss rate is the product of the two-year cumulative impairment rate and the two-year cumulative LGD rate, i.e.  $16.3\%*43.9\%=7.2\%$ .

## Appendix III: Material Impairment Rates

| <b>Global Structured Finance</b> | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
|----------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Aaa                              | 0.20%         | 0.29%         | 0.35%         | 0.42%         | 0.47%         | 0.50%         | 0.52%         |
| Aa                               | 1.57%         | 2.72%         | 3.15%         | 3.66%         | 4.17%         | 4.59%         | 4.94%         |
| A                                | 2.59%         | 5.03%         | 6.00%         | 6.72%         | 7.43%         | 8.16%         | 8.67%         |
| Baa                              | 5.73%         | 10.98%        | 14.78%        | 17.99%        | 21.24%        | 23.82%        | 25.92%        |
| Ba                               | 9.21%         | 15.77%        | 20.28%        | 23.55%        | 25.72%        | 27.77%        | 29.56%        |
| B                                | 10.07%        | 14.66%        | 19.03%        | 22.88%        | 26.78%        | 29.78%        | 32.26%        |
| Caa                              | 29.24%        | 39.06%        | 46.90%        | 55.13%        | 61.19%        | 65.40%        | 68.11%        |
| Investment Grade                 | 1.43%         | 2.70%         | 3.47%         | 4.14%         | 4.79%         | 5.31%         | 5.73%         |
| Speculative Grade                | 10.59%        | 16.76%        | 21.40%        | 25.07%        | 27.91%        | 30.31%        | 32.34%        |
| All Ratings                      | 2.07%         | 3.71%         | 4.79%         | 5.71%         | 6.54%         | 7.22%         | 7.76%         |
| <b>US ABS excl HEL</b>           | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa                              | 0.03%         | 0.05%         | 0.17%         | 0.33%         | 0.46%         | 0.51%         | 0.56%         |
| Aa                               | 0.81%         | 2.17%         | 3.66%         | 5.35%         | 6.91%         | 7.72%         | 8.25%         |
| A                                | 0.32%         | 1.10%         | 2.11%         | 3.11%         | 4.23%         | 5.21%         | 5.69%         |
| Baa                              | 1.53%         | 4.21%         | 7.74%         | 11.19%        | 17.02%        | 23.97%        | 30.19%        |
| Ba                               | 8.90%         | 19.60%        | 28.67%        | 41.93%        | 50.98%        | 59.42%        | 64.62%        |
| B                                | 12.78%        | 21.13%        | 27.85%        | 32.55%        | 43.41%        | 48.56%        | 48.56%        |
| Caa                              | 26.93%        | 40.99%        | 51.24%        | 64.89%        | 67.95%        | NA            | NA            |
| Investment Grade                 | 0.29%         | 0.85%         | 1.63%         | 2.45%         | 3.52%         | 4.51%         | 5.36%         |
| Speculative Grade                | 12.55%        | 23.10%        | 31.72%        | 42.94%        | 51.85%        | 59.13%        | 62.79%        |
| All Ratings                      | 0.82%         | 1.80%         | 2.89%         | 4.06%         | 5.27%         | 6.36%         | 7.24%         |
| <b>US HEL</b>                    | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa                              | 0.04%         | 0.13%         | 0.20%         | 0.29%         | 0.33%         | 0.34%         | 0.34%         |
| Aa                               | 2.55%         | 4.70%         | 5.01%         | 5.21%         | 5.29%         | 5.35%         | 5.38%         |
| A                                | 3.39%         | 7.57%         | 8.68%         | 9.43%         | 10.34%        | 11.76%        | 13.44%        |
| Baa                              | 8.73%         | 17.47%        | 24.52%        | 31.92%        | 39.72%        | 44.79%        | 47.50%        |
| Ba                               | 28.23%        | 46.09%        | 58.12%        | 63.23%        | 65.70%        | 67.27%        | 68.78%        |
| B                                | 55.66%        | 66.61%        | 74.10%        | 78.41%        | 81.63%        | 82.92%        | 84.07%        |
| Caa                              | 69.77%        | 74.22%        | 76.64%        | 79.16%        | 82.00%        | 86.14%        | 89.78%        |
| Investment Grade                 | 2.55%         | 5.28%         | 6.94%         | 8.46%         | 9.78%         | 10.64%        | 11.17%        |
| Speculative Grade                | 35.24%        | 51.16%        | 61.85%        | 66.78%        | 69.64%        | 71.35%        | 72.93%        |
| All Ratings                      | 4.28%         | 7.78%         | 9.99%         | 11.73%        | 13.18%        | 14.13%        | 14.77%        |

| <b>US RMBS</b>     | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
|--------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Aaa                | 0.00%         | 0.01%         | 0.01%         | 0.01%         | 0.01%         | 0.01%         | 0.01%         |
| Aa                 | 0.82%         | 1.36%         | 1.40%         | 1.43%         | 1.45%         | 1.46%         | 1.46%         |
| A                  | 4.05%         | 7.68%         | 8.30%         | 8.50%         | 8.65%         | 8.71%         | 8.75%         |
| Baa                | 8.38%         | 14.69%        | 16.66%        | 17.34%        | 17.90%        | 18.40%        | 18.86%        |
| Ba                 | 7.24%         | 11.90%        | 14.04%        | 15.49%        | 16.72%        | 17.99%        | 18.70%        |
| B                  | 6.26%         | 9.78%         | 13.00%        | 15.57%        | 17.35%        | 18.41%        | 18.76%        |
| Caa                | 68.42%        | 73.28%        | 77.67%        | 82.73%        | 83.15%        | 83.15%        | 83.15%        |
| Investment Grade   | 0.91%         | 1.66%         | 1.85%         | 1.92%         | 1.98%         | 2.03%         | 2.08%         |
| Speculative Grade  | 7.34%         | 11.62%        | 14.14%        | 16.00%        | 17.40%        | 18.59%        | 19.19%        |
| All Ratings        | 1.15%         | 2.05%         | 2.37%         | 2.54%         | 2.68%         | 2.80%         | 2.88%         |
| <b>US CMBS</b>     | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa                | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| Aa                 | 0.03%         | 0.08%         | 0.08%         | 0.08%         | 0.08%         | 0.08%         | 0.08%         |
| A                  | 0.03%         | 0.09%         | 0.16%         | 0.16%         | 0.23%         | 0.43%         | 0.43%         |
| Baa                | 0.22%         | 0.57%         | 0.73%         | 0.79%         | 1.01%         | 1.09%         | 1.91%         |
| Ba                 | 0.37%         | 0.89%         | 1.74%         | 3.02%         | 4.38%         | 6.28%         | 7.80%         |
| B                  | 1.58%         | 3.86%         | 6.99%         | 10.73%        | 15.02%        | 19.33%        | 23.68%        |
| Caa                | 14.57%        | 25.90%        | 35.16%        | 43.74%        | 50.81%        | 55.73%        | 58.63%        |
| Investment Grade   | 0.06%         | 0.16%         | 0.22%         | 0.23%         | 0.30%         | 0.36%         | 0.58%         |
| Speculative Grade  | 1.61%         | 3.45%         | 5.73%         | 8.45%         | 11.39%        | 14.53%        | 17.39%        |
| All Ratings        | 0.41%         | 0.92%         | 1.51%         | 2.19%         | 2.96%         | 3.74%         | 4.56%         |
| <b>Global CDOs</b> | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa                | 2.89%         | 3.94%         | 4.23%         | 4.49%         | 4.65%         | 4.75%         | 4.75%         |
| Aa                 | 3.86%         | 6.05%         | 7.20%         | 8.71%         | 10.76%        | 13.55%        | 16.60%        |
| A                  | 5.93%         | 10.07%        | 12.74%        | 14.82%        | 16.45%        | 18.38%        | 20.48%        |
| Baa                | 7.57%         | 13.72%        | 19.27%        | 23.71%        | 27.37%        | 30.08%        | 31.97%        |
| Ba                 | 7.07%         | 12.30%        | 16.66%        | 20.03%        | 22.54%        | 25.04%        | 30.04%        |
| B                  | 12.74%        | 21.71%        | 29.51%        | 34.85%        | 40.35%        | 43.50%        | 45.47%        |
| Caa                | 23.67%        | 32.26%        | 38.91%        | 47.74%        | 57.77%        | 61.86%        | 61.86%        |
| Investment Grade   | 4.72%         | 7.82%         | 10.08%        | 12.05%        | 13.84%        | 15.57%        | 17.14%        |
| Speculative Grade  | 9.23%         | 15.31%        | 20.42%        | 24.53%        | 27.93%        | 30.53%        | 34.80%        |
| All Ratings        | 5.30%         | 8.81%         | 11.49%        | 13.80%        | 15.85%        | 17.70%        | 19.60%        |

| <b>EMEA excl CDOs &amp; Other</b>   | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
|---|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Aaa   | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| Aa  | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| A   | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.05%         | 0.21%         | 0.21%         |
| Baa   | 0.03%         | 0.08%         | 0.15%         | 0.27%         | 0.57%         | 1.03%         | 1.03%         |
| Ba  | 0.06%         | 0.29%         | 0.58%         | 1.24%         | 4.16%         | 5.49%         | 5.49%         |
| B   | 0.60%         | 1.32%         | 2.07%         | 19.01%        | 19.01%        | 19.01%        | 19.01%        |
| Caa   | 12.37%        | 29.92%        | 66.02%        | NA            | NA            | NA            | NA            |
| Investment Grade  | 0.01%         | 0.01%         | 0.02%         | 0.04%         | 0.10%         | 0.20%         | 0.20%         |
| Speculative Grade   | 0.67%         | 1.70%         | 3.13%         | 5.15%         | 7.77%         | 8.96%         | 8.96%         |
| All Ratings   | 0.04%         | 0.09%         | 0.17%         | 0.27%         | 0.42%         | 0.56%         | 0.56%         |
| <b>Global SF excl SF CDOs, Other, and '05-'07 vintage US HEL &amp; RMBS</b> |               |               |               |               |               |               |               |
|   | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa   | 0.01%         | 0.02%         | 0.06%         | 0.11%         | 0.15%         | 0.16%         | 0.17%         |
| Aa  | 0.14%         | 0.36%         | 0.64%         | 1.01%         | 1.39%         | 1.68%         | 1.94%         |
| A   | 0.20%         | 0.60%         | 1.09%         | 1.66%         | 2.31%         | 3.03%         | 3.56%         |
| Baa   | 0.97%         | 2.96%         | 5.67%         | 8.74%         | 12.05%        | 14.76%        | 17.10%        |
| Ba  | 2.69%         | 6.18%         | 9.71%         | 13.14%        | 15.43%        | 17.75%        | 19.82%        |
| B   | 5.57%         | 10.14%        | 14.55%        | 18.61%        | 22.70%        | 25.86%        | 28.49%        |
| Caa   | 21.75%        | 32.48%        | 41.16%        | 50.36%        | 56.89%        | 61.56%        | 64.57%        |
| Investment Grade  | 0.18%         | 0.53%         | 1.01%         | 1.57%         | 2.15%         | 2.64%         | 3.04%         |
| Speculative Grade   | 4.72%         | 8.96%         | 13.05%        | 16.94%        | 19.97%        | 22.63%        | 24.91%        |
| All Ratings   | 0.51%         | 1.16%         | 1.92%         | 2.73%         | 3.51%         | 4.16%         | 4.69%         |
| <b>US HEL excl '05-'07 vintages</b>   |               |               |               |               |               |               |               |
|   | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa   | 0.01%         | 0.05%         | 0.12%         | 0.21%         | 0.25%         | 0.26%         | 0.26%         |
| Aa  | 0.02%         | 0.06%         | 0.23%         | 0.44%         | 0.52%         | 0.58%         | 0.62%         |
| A   | 0.18%         | 0.58%         | 1.10%         | 1.92%         | 2.90%         | 4.44%         | 6.25%         |
| Baa   | 1.72%         | 5.87%         | 12.10%        | 20.72%        | 29.80%        | 35.71%        | 38.87%        |
| Ba  | 9.78%         | 21.35%        | 33.01%        | 41.19%        | 45.14%        | 47.65%        | 50.06%        |
| B   | 33.34%        | 49.73%        | 60.80%        | 67.32%        | 72.19%        | 74.14%        | 75.89%        |
| Caa   | 48.81%        | 56.34%        | 60.44%        | 64.71%        | 69.51%        | 76.52%        | 82.70%        |
| Investment Grade  | 0.32%         | 1.13%         | 2.37%         | 3.96%         | 5.35%         | 6.25%         | 6.81%         |
| Speculative Grade   | 17.56%        | 29.88%        | 40.94%        | 48.57%        | 53.00%        | 55.66%        | 58.10%        |
| All Ratings   | 0.96%         | 2.22%         | 3.86%         | 5.72%         | 7.27%         | 8.28%         | 8.96%         |

| <b>US RMBS excl '05-'07 vintages</b> | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
|--------------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Aaa                                  | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.01%         | 0.01%         |
| Aa                                   | 0.02%         | 0.04%         | 0.07%         | 0.10%         | 0.11%         | 0.12%         | 0.13%         |
| A                                    | 0.12%         | 0.26%         | 0.42%         | 0.64%         | 0.80%         | 0.86%         | 0.91%         |
| Baa                                  | 0.43%         | 1.07%         | 1.90%         | 2.71%         | 3.36%         | 3.95%         | 4.49%         |
| Ba                                   | 1.07%         | 2.49%         | 4.18%         | 5.79%         | 7.16%         | 8.58%         | 9.37%         |
| B                                    | 2.66%         | 5.52%         | 8.44%         | 11.14%        | 13.02%        | 14.14%        | 14.50%        |
| Caa                                  | 38.53%        | 47.99%        | 56.54%        | 66.38%        | 67.20%        | 67.20%        | 67.20%        |
| Investment Grade                     | 0.03%         | 0.09%         | 0.15%         | 0.23%         | 0.29%         | 0.34%         | 0.38%         |
| Speculative Grade                    | 1.79%         | 3.76%         | 5.91%         | 7.95%         | 9.48%         | 10.79%        | 11.44%        |
| All Ratings                          | 0.11%         | 0.25%         | 0.42%         | 0.59%         | 0.73%         | 0.86%         | 0.94%         |
| <b>Global CDOs excl SF CDOs</b>      | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa                                  | 0.05%         | 0.07%         | 0.09%         | 0.10%         | 0.10%         | 0.10%         | 0.10%         |
| Aa                                   | 0.14%         | 0.26%         | 0.45%         | 0.84%         | 1.76%         | 3.22%         | 5.43%         |
| A                                    | 0.40%         | 0.95%         | 1.49%         | 2.24%         | 3.03%         | 4.76%         | 7.33%         |
| Baa                                  | 1.33%         | 3.58%         | 6.08%         | 8.14%         | 10.48%        | 12.63%        | 14.85%        |
| Ba                                   | 1.99%         | 4.87%         | 7.75%         | 10.02%        | 11.81%        | 14.55%        | 20.47%        |
| B                                    | 8.59%         | 17.68%        | 25.57%        | 31.27%        | 37.00%        | 40.25%        | 42.62%        |
| Caa                                  | 17.34%        | 25.81%        | 32.81%        | 42.73%        | 53.11%        | 57.64%        | 57.64%        |
| Investment Grade                     | 0.44%         | 1.14%         | 1.94%         | 2.71%         | 3.69%         | 4.88%         | 6.37%         |
| Speculative Grade                    | 4.23%         | 8.61%         | 12.72%        | 16.18%        | 19.14%        | 21.95%        | 27.00%        |
| All Ratings                          | 1.01%         | 2.30%         | 3.67%         | 4.92%         | 6.24%         | 7.68%         | 9.64%         |

| <b>Global Structured Finance</b> | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
|----------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Aaa                              | 0.35%         | 1.18%         | 1.54%         | 1.63%         | 1.80%         | 1.89%         | 1.95%         |
| Aa                               | 1.12%         | 8.64%         | 13.12%        | 13.90%        | 14.57%        | 15.12%        | 15.71%        |
| A                                | 2.27%         | 13.27%        | 22.53%        | 24.45%        | 25.28%        | 26.17%        | 26.80%        |
| Baa                              | 4.93%         | 17.45%        | 28.41%        | 35.25%        | 38.48%        | 41.88%        | 43.89%        |
| Ba                               | 6.27%         | 18.72%        | 29.63%        | 37.35%        | 39.95%        | 41.77%        | 43.07%        |
| B                                | 1.35%         | 4.33%         | 10.38%        | 15.09%        | 19.33%        | 24.07%        | 26.93%        |
| Caa                              | 1.23%         | 2.73%         | 7.01%         | 12.56%        | 22.85%        | 42.13%        | 45.75%        |
| Investment Grade                 | 1.37%         | 6.34%         | 10.33%        | 11.98%        | 12.92%        | 13.81%        | 14.40%        |
| Speculative Grade                | 5.03%         | 15.17%        | 24.90%        | 31.89%        | 34.94%        | 37.68%        | 39.42%        |
| All Ratings                      | 1.59%         | 6.88%         | 11.25%        | 13.27%        | 14.38%        | 15.43%        | 16.14%        |
| <b>US ABS excl HEL</b>           | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa                              | 0.08%         | 0.11%         | 0.14%         | 0.30%         | 0.63%         | 0.63%         | 0.73%         |
| Aa                               | 0.83%         | 1.82%         | 2.83%         | 4.45%         | 7.92%         | 10.25%        | 11.04%        |
| A                                | 0.07%         | 0.34%         | 1.08%         | 2.28%         | 3.36%         | 4.77%         | 5.58%         |
| Baa                              | 0.15%         | 1.38%         | 4.90%         | 8.21%         | 12.54%        | 18.72%        | 26.07%        |
| Ba                               | 1.86%         | 12.32%        | 24.57%        | 33.17%        | 40.11%        | 49.53%        | 62.56%        |
| B                                | 0.00%         | 11.76%        | 39.34%        | 39.34%        | 43.52%        | 56.81%        | 56.81%        |
| Caa                              | 50.00%        | 50.00%        | 50.00%        | NA            | NA            | NA            | NA            |
| Investment Grade                 | 0.14%         | 0.38%         | 0.93%         | 1.71%         | 2.84%         | 3.93%         | 4.94%         |
| Speculative Grade                | 1.92%         | 12.52%        | 26.96%        | 34.24%        | 40.71%        | 50.78%        | 61.42%        |
| All Ratings                      | 0.17%         | 0.62%         | 1.45%         | 2.36%         | 3.60%         | 4.86%         | 6.07%         |
| <b>US HEL</b>                    | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa                              | 0.00%         | 0.44%         | 0.97%         | 1.03%         | 1.23%         | 1.27%         | 1.27%         |
| Aa                               | 0.41%         | 17.04%        | 26.72%        | 27.24%        | 27.30%        | 27.30%        | 27.49%        |
| A                                | 1.82%         | 22.85%        | 40.81%        | 42.89%        | 43.21%        | 43.78%        | 45.31%        |
| Baa                              | 6.59%         | 26.28%        | 44.70%        | 54.18%        | 58.40%        | 63.67%        | 66.69%        |
| Ba                               | 16.53%        | 44.55%        | 68.09%        | 83.44%        | 85.51%        | 87.23%        | 87.79%        |
| B                                | 1.37%         | 11.16%        | 36.13%        | 54.09%        | 60.21%        | 69.57%        | 69.57%        |
| Caa                              | NA            | NA            | NA            | NA            | NA            | NA            | NA            |
| Investment Grade                 | 1.71%         | 12.67%        | 22.46%        | 25.84%        | 27.42%        | 29.06%        | 29.96%        |
| Speculative Grade                | 15.82%        | 43.01%        | 66.58%        | 82.17%        | 84.42%        | 86.63%        | 87.11%        |
| All Ratings                      | 2.40%         | 14.20%        | 24.86%        | 29.16%        | 30.83%        | 32.54%        | 33.42%        |

| <b>US RMBS</b>     | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
|--------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Aaa                | 0.00%         | 0.01%         | 0.03%         | 0.03%         | 0.03%         | 0.03%         | 0.03%         |
| Aa                 | 0.10%         | 4.61%         | 7.47%         | 7.56%         | 7.61%         | 7.61%         | 7.70%         |
| A                  | 2.32%         | 17.44%        | 30.34%        | 32.56%        | 32.79%        | 33.15%        | 33.15%        |
| Baa                | 5.59%         | 26.55%        | 39.01%        | 45.73%        | 47.22%        | 47.77%        | 48.51%        |
| Ba                 | 3.84%         | 19.98%        | 30.90%        | 35.25%        | 37.99%        | 40.24%        | 41.48%        |
| B                  | 2.43%         | 7.23%         | 14.61%        | 19.90%        | 25.41%        | 30.14%        | 33.21%        |
| Caa                | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| Investment Grade   | 0.58%         | 3.92%         | 6.39%         | 7.26%         | 7.46%         | 7.55%         | 7.66%         |
| Speculative Grade  | 3.40%         | 15.95%        | 25.76%        | 30.40%        | 34.00%        | 37.00%        | 38.77%        |
| All Ratings        | 0.67%         | 4.32%         | 7.08%         | 8.13%         | 8.56%         | 8.86%         | 9.12%         |
| <b>US CMBS</b>     | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa                | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| Aa                 | 0.00%         | 0.16%         | 0.16%         | 0.16%         | 0.16%         | 0.16%         | 0.16%         |
| A                  | 0.00%         | 0.07%         | 0.33%         | 0.71%         | 0.71%         | 1.35%         | 1.35%         |
| Baa                | 0.04%         | 0.52%         | 1.06%         | 1.51%         | 1.74%         | 1.74%         | 1.74%         |
| Ba                 | 0.16%         | 1.22%         | 2.69%         | 3.34%         | 3.84%         | 4.09%         | 4.65%         |
| B                  | 0.69%         | 1.71%         | 3.41%         | 6.08%         | 9.39%         | 12.16%        | 15.66%        |
| Caa                | 0.00%         | 0.00%         | 3.39%         | 10.82%        | 22.71%        | 43.60%        | 47.63%        |
| Investment Grade   | 0.01%         | 0.17%         | 0.36%         | 0.53%         | 0.59%         | 0.72%         | 0.72%         |
| Speculative Grade  | 0.39%         | 1.41%         | 3.01%         | 4.70%         | 6.72%         | 8.73%         | 10.76%        |
| All Ratings        | 0.09%         | 0.43%         | 0.94%         | 1.48%         | 2.04%         | 2.65%         | 3.18%         |
| <b>Global CDOs</b> | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa                | 4.32%         | 13.49%        | 16.41%        | 17.09%        | 17.97%        | 18.73%        | 19.38%        |
| Aa                 | 5.23%         | 13.45%        | 17.83%        | 20.71%        | 22.56%        | 24.30%        | 27.76%        |
| A                  | 7.25%         | 16.52%        | 22.91%        | 26.63%        | 29.96%        | 32.25%        | 33.63%        |
| Baa                | 9.22%         | 17.35%        | 24.81%        | 31.51%        | 36.00%        | 40.72%        | 42.88%        |
| Ba                 | 6.18%         | 14.17%        | 20.35%        | 26.09%        | 29.75%        | 31.14%        | 32.04%        |
| B                  | 4.67%         | 10.45%        | 27.69%        | 40.15%        | 44.14%        | 54.46%        | 54.46%        |
| Caa                | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | NA            | NA            |
| Investment Grade   | 6.13%         | 14.90%        | 19.82%        | 22.96%        | 25.44%        | 27.73%        | 29.51%        |
| Speculative Grade  | 6.05%         | 13.86%        | 20.95%        | 27.29%        | 31.00%        | 33.67%        | 34.45%        |
| All Ratings        | 6.12%         | 14.80%        | 19.93%        | 23.38%        | 25.99%        | 28.33%        | 29.98%        |



| <b>EMEA excl CDOs &amp; Other</b>   | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
|---|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Aaa   | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| Aa  | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| A   | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.28%         | 0.28%         |
| Baa   | 0.00%         | 0.09%         | 0.09%         | 0.09%         | 0.09%         | 0.53%         | 0.53%         |
| Ba  | 0.28%         | 0.28%         | 0.28%         | 0.94%         | 4.34%         | 6.29%         | 6.29%         |
| B   | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| Caa   | 0.00%         | 6.06%         | 16.50%        | 16.50%        | NA            | NA            | NA            |
| Investment Grade  | 0.00%         | 0.02%         | 0.02%         | 0.02%         | 0.02%         | 0.16%         | 0.16%         |
| Speculative Grade   | 0.22%         | 0.46%         | 0.82%         | 1.39%         | 4.58%         | 6.42%         | 6.42%         |
| All Ratings   | 0.01%         | 0.04%         | 0.06%         | 0.09%         | 0.22%         | 0.44%         | 0.44%         |
| <b>Global SF excl SF CDOs,<br/>Other, and '05-'07 vintage US<br/>HEL &amp; RMBS</b> | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa   | 0.03%         | 0.06%         | 0.07%         | 0.13%         | 0.23%         | 0.24%         | 0.26%         |
| Aa  | 0.10%         | 0.33%         | 0.49%         | 0.90%         | 1.37%         | 1.72%         | 2.08%         |
| A   | 0.08%         | 0.54%         | 1.11%         | 1.74%         | 2.39%         | 3.44%         | 4.17%         |
| Baa   | 0.11%         | 0.83%         | 2.28%         | 6.02%         | 10.12%        | 14.43%        | 17.19%        |
| Ba  | 0.24%         | 2.09%         | 5.27%         | 10.67%        | 13.86%        | 16.29%        | 18.20%        |
| B   | 0.74%         | 2.51%         | 7.18%         | 11.49%        | 15.94%        | 20.74%        | 23.75%        |
| Caa   | 1.23%         | 2.73%         | 7.01%         | 12.56%        | 22.85%        | 42.13%        | 45.75%        |
| Investment Grade  | 0.06%         | 0.27%         | 0.58%         | 1.31%         | 2.12%         | 2.92%         | 3.48%         |
| Speculative Grade   | 0.39%         | 2.20%         | 5.82%         | 10.88%        | 14.54%        | 17.98%        | 20.30%        |
| All Ratings   | 0.08%         | 0.40%         | 0.95%         | 1.98%         | 3.00%         | 4.00%         | 4.71%         |
| <b>US HEL excl '05-'07 vintages</b>   | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa   | 0.00%         | 0.00%         | 0.00%         | 0.07%         | 0.27%         | 0.31%         | 0.31%         |
| Aa  | 0.00%         | 0.00%         | 0.00%         | 0.58%         | 0.67%         | 0.67%         | 0.93%         |
| A   | 0.00%         | 0.00%         | 0.17%         | 0.66%         | 1.23%         | 2.23%         | 4.88%         |
| Baa   | 0.04%         | 0.33%         | 1.23%         | 9.38%         | 17.74%        | 28.16%        | 34.13%        |
| Ba  | 0.00%         | 1.90%         | 10.55%        | 40.43%        | 47.88%        | 54.06%        | 56.10%        |
| B   | 1.82%         | 12.73%        | 40.29%        | 57.08%        | 62.80%        | 71.56%        | 71.56%        |
| Caa   | NA            | NA            | NA            | NA            | NA            | NA            | NA            |
| Investment Grade  | 0.01%         | 0.06%         | 0.26%         | 2.16%         | 4.24%         | 6.40%         | 7.58%         |
| Speculative Grade   | 0.27%         | 3.51%         | 15.06%        | 42.88%        | 50.08%        | 57.17%        | 58.71%        |
| All Ratings   | 0.01%         | 0.15%         | 0.69%         | 3.44%         | 5.71%         | 8.04%         | 9.24%         |

| <b>US RMBS excl '05-'07 vintages</b> | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
|--------------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Aaa                                  | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| Aa                                   | 0.00%         | 0.00%         | 0.00%         | 0.05%         | 0.10%         | 0.10%         | 0.20%         |
| A                                    | 0.00%         | 0.08%         | 0.33%         | 0.84%         | 1.17%         | 1.70%         | 1.70%         |
| Baa                                  | 0.00%         | 0.00%         | 0.17%         | 3.81%         | 6.46%         | 7.43%         | 8.74%         |
| Ba                                   | 0.00%         | 0.00%         | 0.87%         | 5.16%         | 9.18%         | 12.48%        | 14.29%        |
| B                                    | 0.27%         | 0.54%         | 3.18%         | 7.15%         | 13.53%        | 19.01%        | 22.58%        |
| Caa                                  | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| Investment Grade                     | 0.00%         | 0.00%         | 0.03%         | 0.31%         | 0.53%         | 0.62%         | 0.75%         |
| Speculative Grade                    | 0.10%         | 0.20%         | 1.73%         | 5.89%         | 10.76%        | 14.82%        | 17.22%        |
| All Ratings                          | 0.00%         | 0.01%         | 0.11%         | 0.58%         | 1.04%         | 1.37%         | 1.65%         |
| <b>Global CDOs excl SF CDOs</b>      | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa                                  | 0.23%         | 0.47%         | 0.55%         | 0.83%         | 0.83%         | 0.83%         | 0.83%         |
| Aa                                   | 0.10%         | 0.60%         | 0.93%         | 1.55%         | 1.87%         | 2.11%         | 4.05%         |
| A                                    | 0.20%         | 2.19%         | 3.93%         | 4.62%         | 6.20%         | 8.66%         | 9.24%         |
| Baa                                  | 0.37%         | 2.35%         | 6.15%         | 8.90%         | 11.21%        | 14.15%        | 16.09%        |
| Ba                                   | 0.17%         | 2.74%         | 6.56%         | 9.48%         | 11.59%        | 12.34%        | 13.59%        |
| B                                    | 3.35%         | 8.69%         | 26.33%        | 40.10%        | 44.48%        | 53.89%        | 53.89%        |
| Caa                                  | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | NA            | NA            |
| Investment Grade                     | 0.22%         | 1.28%         | 2.62%         | 3.66%         | 4.64%         | 5.93%         | 6.98%         |
| Speculative Grade                    | 0.47%         | 3.28%         | 8.45%         | 12.52%        | 14.98%        | 17.22%        | 18.29%        |
| All Ratings                          | 0.25%         | 1.51%         | 3.31%         | 4.72%         | 5.90%         | 7.32%         | 8.38%         |

## Appendix IV: Estimated Historical Average Loss Rates

| <b>Global Structured Finance</b> | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
|----------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Aaa                              | 0.17%         | 0.24%         | 0.28%         | 0.32%         | 0.35%         | 0.37%         | 0.38%         |
| Aa                               | 1.32%         | 2.27%         | 2.61%         | 2.96%         | 3.27%         | 3.50%         | 3.69%         |
| A                                | 2.37%         | 4.53%         | 5.36%         | 5.88%         | 6.30%         | 6.66%         | 6.86%         |
| Baa                              | 5.04%         | 9.30%         | 11.95%        | 13.66%        | 15.00%        | 15.96%        | 16.66%        |
| Ba                               | 8.12%         | 13.30%        | 16.40%        | 18.25%        | 19.37%        | 20.38%        | 21.35%        |
| B                                | 8.80%         | 12.05%        | 14.86%        | 17.08%        | 19.20%        | 20.80%        | 22.13%        |
| Caa                              | 26.31%        | 33.77%        | 39.34%        | 45.06%        | 49.14%        | 52.03%        | 53.66%        |
| Investment Grade                 | 1.26%         | 2.32%         | 2.89%         | 3.28%         | 3.58%         | 3.81%         | 3.96%         |
| Speculative Grade                | 9.36%         | 14.13%        | 17.28%        | 19.40%        | 20.93%        | 22.18%        | 23.27%        |
| All Ratings                      | 1.83%         | 3.18%         | 3.97%         | 4.50%         | 4.90%         | 5.21%         | 5.43%         |
| <b>US ABS excl HEL</b>           | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa                              | 0.02%         | 0.04%         | 0.07%         | 0.10%         | 0.13%         | 0.13%         | 0.13%         |
| Aa                               | 0.48%         | 1.21%         | 2.12%         | 3.05%         | 3.84%         | 4.20%         | 4.41%         |
| A                                | 0.24%         | 0.82%         | 1.53%         | 2.15%         | 2.76%         | 3.18%         | 3.34%         |
| Baa                              | 1.21%         | 3.12%         | 5.38%         | 7.35%         | 10.23%        | 13.29%        | 15.62%        |
| Ba                               | 7.15%         | 14.82%        | 20.73%        | 28.09%        | 33.14%        | 37.92%        | 40.88%        |
| B                                | 10.10%        | 16.31%        | 20.94%        | 23.84%        | 30.46%        | 33.18%        | 33.18%        |
| Caa                              | 20.74%        | 30.75%        | 37.51%        | 45.49%        | 45.72%        | NA            | NA            |
| Investment Grade                 | 0.21%         | 0.59%         | 1.07%         | 1.52%         | 2.03%         | 2.47%         | 2.78%         |
| Speculative Grade                | 9.92%         | 17.53%        | 23.20%        | 29.52%        | 34.49%        | 38.59%        | 40.67%        |
| All Ratings                      | 0.63%         | 1.32%         | 2.00%         | 2.64%         | 3.24%         | 3.73%         | 4.07%         |
| <b>US HEL</b>                    | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa                              | 0.02%         | 0.07%         | 0.09%         | 0.10%         | 0.10%         | 0.10%         | 0.10%         |
| Aa                               | 2.16%         | 3.94%         | 4.20%         | 4.26%         | 4.27%         | 4.27%         | 4.27%         |
| A                                | 3.08%         | 6.77%         | 7.72%         | 8.13%         | 8.35%         | 8.66%         | 8.96%         |
| Baa                              | 7.79%         | 14.84%        | 19.61%        | 22.83%        | 24.90%        | 26.08%        | 26.73%        |
| Ba                               | 25.25%        | 39.53%        | 47.89%        | 50.62%        | 51.73%        | 52.48%        | 53.38%        |
| B                                | 49.13%        | 56.42%        | 60.49%        | 62.51%        | 63.91%        | 64.66%        | 65.24%        |
| Caa                              | 63.59%        | 66.53%        | 68.16%        | 69.63%        | 71.52%        | 74.56%        | 74.56%        |
| Investment Grade                 | 2.25%         | 4.53%         | 5.73%         | 6.39%         | 6.73%         | 6.93%         | 7.05%         |
| Speculative Grade                | 31.54%        | 44.04%        | 51.33%        | 53.92%        | 55.24%        | 56.15%        | 57.07%        |
| All Ratings                      | 3.81%         | 6.69%         | 8.28%         | 9.07%         | 9.49%         | 9.75%         | 9.95%         |

| <b>US RMBS</b>     | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
|--------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Aaa                | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| Aa                 | 0.68%         | 1.12%         | 1.15%         | 1.16%         | 1.16%         | 1.17%         | 1.17%         |
| A                  | 3.71%         | 6.92%         | 7.44%         | 7.59%         | 7.65%         | 7.68%         | 7.70%         |
| Baa                | 7.45%         | 12.73%        | 14.19%        | 14.62%        | 14.87%        | 15.03%        | 15.14%        |
| Ba                 | 6.47%         | 10.28%        | 11.77%        | 12.62%        | 13.18%        | 13.57%        | 13.70%        |
| B                  | 5.52%         | 8.04%         | 10.09%        | 11.45%        | 12.22%        | 12.59%        | 12.67%        |
| Caa                | 63.61%        | 67.78%        | 70.99%        | 73.99%        | 74.22%        | 74.22%        | 74.22%        |
| Investment Grade   | 0.80%         | 1.44%         | 1.59%         | 1.63%         | 1.66%         | 1.67%         | 1.69%         |
| Speculative Grade  | 6.57%         | 9.94%         | 11.65%        | 12.69%        | 13.31%        | 13.70%        | 13.82%        |
| All Ratings        | 1.02%         | 1.78%         | 2.01%         | 2.12%         | 2.18%         | 2.21%         | 2.23%         |
| <b>US CMBS</b>     | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa                | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| Aa                 | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| A                  | 0.01%         | 0.02%         | 0.03%         | 0.03%         | 0.04%         | 0.07%         | 0.07%         |
| Baa                | 0.08%         | 0.23%         | 0.31%         | 0.33%         | 0.41%         | 0.45%         | 0.70%         |
| Ba                 | 0.15%         | 0.33%         | 0.65%         | 1.13%         | 1.70%         | 2.41%         | 2.98%         |
| B                  | 1.08%         | 2.77%         | 4.99%         | 7.51%         | 10.28%        | 12.89%        | 15.38%        |
| Caa                | 12.24%        | 21.68%        | 29.04%        | 35.45%        | 40.36%        | 43.54%        | 45.28%        |
| Investment Grade   | 0.02%         | 0.06%         | 0.08%         | 0.09%         | 0.11%         | 0.13%         | 0.19%         |
| Speculative Grade  | 1.21%         | 2.56%         | 4.07%         | 5.76%         | 7.54%         | 9.23%         | 10.75%        |
| All Ratings        | 0.29%         | 0.64%         | 1.03%         | 1.45%         | 1.89%         | 2.30%         | 2.69%         |
| <b>Global CDOs</b> | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa                | 2.58%         | 3.52%         | 3.79%         | 4.03%         | 4.17%         | 4.26%         | 4.26%         |
| Aa                 | 3.37%         | 5.24%         | 6.22%         | 7.44%         | 8.91%         | 10.68%        | 12.55%        |
| A                  | 5.60%         | 9.43%         | 11.87%        | 13.74%        | 15.26%        | 17.04%        | 18.96%        |
| Baa                | 6.51%         | 11.45%        | 15.70%        | 18.98%        | 21.52%        | 23.18%        | 24.08%        |
| Ba                 | 6.07%         | 10.13%        | 13.29%        | 15.56%        | 17.30%        | 19.32%        | 23.11%        |
| B                  | 11.03%        | 17.23%        | 22.35%        | 25.37%        | 28.11%        | 29.56%        | 30.86%        |
| Caa                | 20.87%        | 27.64%        | 32.37%        | 39.48%        | 46.87%        | 49.97%        | 49.97%        |
| Investment Grade   | 4.20%         | 6.88%         | 8.77%         | 10.36%        | 11.74%        | 12.95%        | 13.93%        |
| Speculative Grade  | 8.00%         | 12.62%        | 16.24%        | 18.95%        | 21.15%        | 23.12%        | 26.32%        |
| All Ratings        | 4.69%         | 7.66%         | 9.83%         | 11.63%        | 13.16%        | 14.48%        | 15.72%        |

| <b>EMEA excl CDOs &amp; Other</b>   | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
|---|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Aaa   | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| Aa  | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| A   | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.05%         | 0.18%         | 0.18%         |
| Baa   | 0.02%         | 0.05%         | 0.10%         | 0.17%         | 0.34%         | 0.60%         | 0.60%         |
| Ba  | 0.03%         | 0.12%         | 0.23%         | 0.65%         | 1.69%         | 2.75%         | 2.75%         |
| B   | 0.36%         | 0.44%         | 0.56%         | 6.25%         | 6.25%         | 6.25%         | 6.25%         |
| Caa   | 8.63%         | 19.52%        | 39.82%        | NA            | NA            | NA            | NA            |
| Investment Grade  | 0.00%         | 0.01%         | 0.01%         | 0.02%         | 0.04%         | 0.08%         | 0.08%         |
| Speculative Grade   | 0.46%         | 1.04%         | 1.78%         | 2.75%         | 3.71%         | 4.66%         | 4.66%         |
| All Ratings   | 0.02%         | 0.06%         | 0.09%         | 0.13%         | 0.18%         | 0.25%         | 0.25%         |
| <b>Global SF excl SF CDOs,<br/>Other, and '05-'07 vintage US<br/>HEL &amp; RMBS</b> | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa   | 0.01%         | 0.01%         | 0.03%         | 0.04%         | 0.04%         | 0.04%         | 0.04%         |
| Aa  | 0.09%         | 0.21%         | 0.37%         | 0.55%         | 0.72%         | 0.81%         | 0.90%         |
| A   | 0.17%         | 0.47%         | 0.80%         | 1.14%         | 1.48%         | 1.80%         | 2.00%         |
| Baa   | 0.75%         | 2.03%         | 3.46%         | 4.82%         | 6.04%         | 6.96%         | 7.70%         |
| Ba  | 2.08%         | 4.40%         | 6.46%         | 8.27%         | 9.43%         | 10.57%        | 11.69%        |
| B   | 4.32%         | 7.49%         | 10.29%        | 12.63%        | 14.88%        | 16.58%        | 17.99%        |
| Caa   | 17.71%        | 25.69%        | 31.78%        | 38.12%        | 42.48%        | 45.69%        | 47.50%        |
| Investment Grade  | 0.13%         | 0.36%         | 0.63%         | 0.88%         | 1.11%         | 1.28%         | 1.41%         |
| Speculative Grade   | 3.71%         | 6.61%         | 9.11%         | 11.28%        | 12.91%        | 14.29%        | 15.52%        |
| All Ratings   | 0.40%         | 0.83%         | 1.26%         | 1.66%         | 2.00%         | 2.26%         | 2.46%         |
| <b>US HEL excl '05-'07 vintages</b>   | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa   | 0.00%         | 0.01%         | 0.01%         | 0.02%         | 0.02%         | 0.02%         | 0.02%         |
| Aa  | 0.01%         | 0.02%         | 0.06%         | 0.10%         | 0.10%         | 0.10%         | 0.10%         |
| A   | 0.11%         | 0.33%         | 0.54%         | 0.80%         | 1.04%         | 1.37%         | 1.70%         |
| Baa   | 1.33%         | 3.81%         | 6.59%         | 9.68%         | 12.09%        | 13.46%        | 14.22%        |
| Ba  | 7.20%         | 14.15%        | 20.13%        | 23.97%        | 25.75%        | 26.94%        | 28.39%        |
| B   | 26.52%        | 37.05%        | 43.01%        | 46.06%        | 48.18%        | 49.32%        | 50.19%        |
| Caa   | 41.46%        | 46.32%        | 49.08%        | 51.57%        | 54.77%        | 59.92%        | 59.92%        |
| Investment Grade  | 0.24%         | 0.71%         | 1.24%         | 1.80%         | 2.16%         | 2.37%         | 2.49%         |
| Speculative Grade   | 13.81%        | 21.37%        | 27.16%        | 30.78%        | 32.82%        | 34.23%        | 35.66%        |
| All Ratings   | 0.75%         | 1.49%         | 2.24%         | 2.94%         | 3.39%         | 3.66%         | 3.88%         |

| <b>US RMBS excl '05-'07 vintages</b> | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
|--------------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Aaa                                  | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| Aa                                   | 0.01%         | 0.01%         | 0.02%         | 0.03%         | 0.03%         | 0.03%         | 0.03%         |
| A                                    | 0.07%         | 0.17%         | 0.26%         | 0.38%         | 0.45%         | 0.48%         | 0.50%         |
| Baa                                  | 0.31%         | 0.73%         | 1.22%         | 1.69%         | 1.98%         | 2.18%         | 2.31%         |
| Ba                                   | 0.80%         | 1.75%         | 2.78%         | 3.71%         | 4.33%         | 4.76%         | 4.91%         |
| B                                    | 2.04%         | 4.02%         | 5.80%         | 7.20%         | 8.00%         | 8.39%         | 8.48%         |
| Caa                                  | 31.71%        | 39.84%        | 46.08%        | 51.92%        | 52.38%        | 52.38%        | 52.38%        |
| Investment Grade                     | 0.02%         | 0.06%         | 0.10%         | 0.14%         | 0.16%         | 0.18%         | 0.19%         |
| Speculative Grade                    | 1.37%         | 2.72%         | 4.03%         | 5.15%         | 5.83%         | 6.25%         | 6.38%         |
| All Ratings                          | 0.08%         | 0.17%         | 0.27%         | 0.37%         | 0.43%         | 0.47%         | 0.49%         |
| <b>Global CDOs excl SF CDOs</b>      | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa                                  | 0.05%         | 0.07%         | 0.09%         | 0.09%         | 0.09%         | 0.09%         | 0.09%         |
| Aa                                   | 0.13%         | 0.23%         | 0.37%         | 0.58%         | 0.78%         | 1.03%         | 1.87%         |
| A                                    | 0.38%         | 0.89%         | 1.39%         | 2.06%         | 2.80%         | 4.41%         | 6.77%         |
| Baa                                  | 1.08%         | 2.75%         | 4.50%         | 5.89%         | 7.32%         | 8.34%         | 9.16%         |
| Ba                                   | 1.67%         | 3.88%         | 5.89%         | 7.38%         | 8.71%         | 10.95%        | 15.43%        |
| B                                    | 6.67%         | 12.92%        | 17.98%        | 21.31%        | 24.50%        | 26.32%        | 27.89%        |
| Caa                                  | 14.12%        | 20.28%        | 24.94%        | 32.80%        | 40.19%        | 43.63%        | 43.63%        |
| Investment Grade                     | 0.38%         | 0.95%         | 1.56%         | 2.12%         | 2.73%         | 3.35%         | 4.09%         |
| Speculative Grade                    | 3.44%         | 6.66%         | 9.44%         | 11.69%        | 13.69%        | 15.89%        | 19.66%        |
| All Ratings                          | 0.85%         | 1.85%         | 2.85%         | 3.71%         | 4.57%         | 5.42%         | 6.56%         |

| <b>Global Structured Finance</b> | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
|----------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Aaa                              | 0.29%         | 0.95%         | 1.22%         | 1.27%         | 1.35%         | 1.40%         | 1.45%         |
| Aa                               | 0.92%         | 6.90%         | 10.46%        | 10.99%        | 11.38%        | 11.74%        | 12.02%        |
| A                                | 2.00%         | 11.40%        | 19.16%        | 20.70%        | 21.24%        | 21.70%        | 21.94%        |
| Baa                              | 4.12%         | 14.37%        | 22.84%        | 27.24%        | 28.64%        | 29.83%        | 30.53%        |
| Ba                               | 5.27%         | 15.49%        | 23.66%        | 28.16%        | 29.46%        | 30.30%        | 30.88%        |
| B                                | 0.95%         | 3.12%         | 7.30%         | 9.96%         | 12.24%        | 14.00%        | 15.31%        |
| Caa                              | 0.82%         | 0.82%         | 4.40%         | 8.53%         | 15.85%        | 27.96%        | 30.16%        |
| Investment Grade                 | 1.15%         | 5.25%         | 8.43%         | 9.54%         | 9.99%         | 10.36%        | 10.59%        |
| Speculative Grade                | 4.19%         | 12.46%        | 19.67%        | 23.73%        | 25.32%        | 26.51%        | 27.30%        |
| All Ratings                      | 1.34%         | 5.69%         | 9.13%         | 10.45%        | 10.99%        | 11.43%        | 11.73%        |
| <b>US ABS excl HEL</b>           | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa                              | 0.05%         | 0.07%         | 0.08%         | 0.14%         | 0.19%         | 0.19%         | 0.19%         |
| Aa                               | 0.72%         | 1.30%         | 1.97%         | 2.69%         | 4.31%         | 5.43%         | 5.70%         |
| A                                | 0.05%         | 0.17%         | 0.62%         | 1.34%         | 1.96%         | 2.62%         | 2.90%         |
| Baa                              | 0.11%         | 0.99%         | 3.33%         | 5.29%         | 7.64%         | 10.66%        | 13.85%        |
| Ba                               | 1.56%         | 8.94%         | 17.47%        | 22.33%        | 25.12%        | 29.39%        | 36.03%        |
| B                                | 0.00%         | 7.83%         | 27.45%        | 27.45%        | 29.95%        | 29.95%        | 29.95%        |
| Caa                              | 33.40%        | 33.40%        | 33.40%        | NA            | NA            | NA            | NA            |
| Investment Grade                 | 0.10%         | 0.26%         | 0.60%         | 1.02%         | 1.54%         | 2.07%         | 2.48%         |
| Speculative Grade                | 1.56%         | 8.98%         | 19.10%        | 23.21%        | 25.95%        | 30.51%        | 35.94%        |
| All Ratings                      | 0.13%         | 0.43%         | 0.97%         | 1.46%         | 2.03%         | 2.63%         | 3.15%         |
| <b>US HEL</b>                    | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa                              | 0.00%         | 0.22%         | 0.51%         | 0.52%         | 0.53%         | 0.53%         | 0.53%         |
| Aa                               | 0.35%         | 13.70%        | 21.50%        | 21.80%        | 21.80%        | 21.80%        | 21.80%        |
| A                                | 1.62%         | 19.59%        | 34.77%        | 36.48%        | 36.56%        | 36.68%        | 36.96%        |
| Baa                              | 5.71%         | 22.06%        | 36.66%        | 42.52%        | 43.81%        | 44.80%        | 45.37%        |
| Ba                               | 14.45%        | 38.19%        | 56.31%        | 65.07%        | 66.01%        | 66.69%        | 67.00%        |
| B                                | 1.09%         | 8.06%         | 25.07%        | 33.27%        | 34.47%        | 36.90%        | 36.90%        |
| Caa                              | NA            | NA            | NA            | NA            | NA            | NA            | NA            |
| Investment Grade                 | 1.49%         | 10.54%        | 18.46%        | 20.64%        | 21.10%        | 21.41%        | 21.57%        |
| Speculative Grade                | 13.82%        | 36.80%        | 54.85%        | 63.66%        | 64.61%        | 65.38%        | 65.65%        |
| All Ratings                      | 2.09%         | 11.87%        | 20.42%        | 23.11%        | 23.61%        | 23.96%        | 24.15%        |

| <b>US RMBS</b>     | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
|--------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Aaa                | 0.00%         | 0.00%         | 0.01%         | 0.01%         | 0.01%         | 0.01%         | 0.01%         |
| Aa                 | 0.08%         | 3.64%         | 5.87%         | 5.92%         | 5.94%         | 5.94%         | 5.96%         |
| A                  | 2.06%         | 14.93%        | 25.67%        | 27.45%        | 27.58%        | 27.70%        | 27.70%        |
| Baa                | 4.71%         | 22.18%        | 31.82%        | 36.45%        | 37.38%        | 37.62%        | 37.98%        |
| Ba                 | 3.27%         | 16.95%        | 25.17%        | 27.86%        | 29.66%        | 30.53%        | 30.77%        |
| B                  | 1.81%         | 5.43%         | 10.48%        | 13.57%        | 16.49%        | 18.17%        | 19.13%        |
| Caa                | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| Investment Grade   | 0.49%         | 3.27%         | 5.23%         | 5.85%         | 5.97%         | 6.01%         | 6.06%         |
| Speculative Grade  | 2.81%         | 13.32%        | 20.54%        | 23.36%        | 25.50%        | 26.62%        | 27.06%        |
| All Ratings        | 0.57%         | 3.60%         | 5.78%         | 6.50%         | 6.75%         | 6.87%         | 6.96%         |
| <b>US CMBS</b>     | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa                | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| Aa                 | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| A                  | 0.00%         | 0.01%         | 0.05%         | 0.05%         | 0.05%         | 0.15%         | 0.15%         |
| Baa                | 0.00%         | 0.12%         | 0.50%         | 0.53%         | 0.62%         | 0.62%         | 0.62%         |
| Ba                 | 0.00%         | 0.06%         | 0.64%         | 0.87%         | 0.99%         | 1.10%         | 1.37%         |
| B                  | 0.46%         | 1.16%         | 2.55%         | 4.22%         | 6.20%         | 7.72%         | 9.64%         |
| Caa                | 0.00%         | 0.00%         | 2.83%         | 8.36%         | 16.82%        | 29.94%        | 32.39%        |
| Investment Grade   | 0.00%         | 0.03%         | 0.12%         | 0.14%         | 0.16%         | 0.18%         | 0.18%         |
| Speculative Grade  | 0.26%         | 0.87%         | 2.03%         | 3.05%         | 4.23%         | 5.37%         | 6.46%         |
| All Ratings        | 0.06%         | 0.19%         | 0.53%         | 0.85%         | 1.17%         | 1.47%         | 1.75%         |
| <b>Global CDOs</b> | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa                | 3.61%         | 11.27%        | 13.74%        | 14.31%        | 15.06%        | 15.70%        | 16.26%        |
| Aa                 | 4.23%         | 10.78%        | 14.18%        | 16.45%        | 17.82%        | 19.17%        | 21.05%        |
| A                  | 6.46%         | 14.52%        | 20.00%        | 23.13%        | 25.96%        | 27.97%        | 29.17%        |
| Baa                | 7.25%         | 13.32%        | 18.44%        | 23.06%        | 26.07%        | 29.20%        | 30.16%        |
| Ba                 | 4.61%         | 10.32%        | 14.46%        | 18.08%        | 19.96%        | 20.89%        | 21.51%        |
| B                  | 2.84%         | 7.00%         | 18.08%        | 24.80%        | 27.10%        | 29.21%        | 29.21%        |
| Caa                | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | NA            | NA            |
| Investment Grade   | 5.08%         | 12.24%        | 16.09%        | 18.45%        | 20.30%        | 22.00%        | 23.08%        |
| Speculative Grade  | 4.45%         | 10.04%        | 14.76%        | 18.65%        | 20.59%        | 21.74%        | 22.29%        |
| All Ratings        | 5.02%         | 12.03%        | 15.96%        | 18.47%        | 20.33%        | 21.96%        | 22.98%        |



| <b>EMEA excl CDOs &amp; Other</b>   | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
|---|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Aaa   | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| Aa  | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| A   | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.23%         | 0.23%         |
| Baa   | 0.00%         | 0.04%         | 0.04%         | 0.04%         | 0.04%         | 0.20%         | 0.20%         |
| Ba  | 0.00%         | 0.00%         | 0.00%         | 0.23%         | 0.73%         | 2.23%         | 2.23%         |
| B   | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         |
| Caa   | 0.00%         | 0.00%         | 0.00%         | 0.00%         | NA            | NA            | NA            |
| Investment Grade  | 0.00%         | 0.01%         | 0.01%         | 0.01%         | 0.01%         | 0.05%         | 0.05%         |
| Speculative Grade   | 0.00%         | 0.00%         | 0.00%         | 0.20%         | 0.67%         | 2.07%         | 2.07%         |
| All Ratings   | 0.01%         | 0.03%         | 0.04%         | 0.05%         | 0.07%         | 0.14%         | 0.14%         |
| <b>Global SF excl SF CDOs,<br/>Other, and '05-'07 vintage US<br/>HEL &amp; RMBS</b> | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa   | 0.02%         | 0.04%         | 0.05%         | 0.08%         | 0.09%         | 0.09%         | 0.09%         |
| Aa  | 0.09%         | 0.22%         | 0.34%         | 0.51%         | 0.72%         | 0.89%         | 0.96%         |
| A   | 0.06%         | 0.39%         | 0.78%         | 1.17%         | 1.53%         | 2.05%         | 2.25%         |
| Baa   | 0.08%         | 0.53%         | 1.46%         | 3.26%         | 4.84%         | 6.13%         | 7.04%         |
| Ba  | 0.19%         | 1.46%         | 3.40%         | 5.85%         | 7.39%         | 8.47%         | 9.32%         |
| B   | 0.49%         | 1.71%         | 4.97%         | 7.33%         | 9.73%         | 11.58%        | 12.95%        |
| Caa   | 0.82%         | 0.82%         | 4.40%         | 8.53%         | 15.85%        | 27.96%        | 30.16%        |
| Investment Grade  | 0.04%         | 0.18%         | 0.39%         | 0.74%         | 1.06%         | 1.34%         | 1.51%         |
| Speculative Grade   | 0.28%         | 1.53%         | 3.86%         | 6.30%         | 8.17%         | 9.66%         | 10.71%        |
| All Ratings   | 0.06%         | 0.28%         | 0.63%         | 1.13%         | 1.56%         | 1.93%         | 2.18%         |
| <b>US HEL excl '05-'07 vintages</b>   | <b>1-Year</b> | <b>2-Year</b> | <b>3-Year</b> | <b>4-Year</b> | <b>5-year</b> | <b>6-Year</b> | <b>7-year</b> |
| Aaa   | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.02%         | 0.02%         | 0.02%         |
| Aa  | 0.00%         | 0.00%         | 0.00%         | 0.09%         | 0.10%         | 0.10%         | 0.10%         |
| A   | 0.00%         | 0.00%         | 0.09%         | 0.28%         | 0.42%         | 0.63%         | 1.12%         |
| Baa   | 0.01%         | 0.21%         | 0.83%         | 4.16%         | 6.69%         | 8.67%         | 9.79%         |
| Ba  | 0.00%         | 1.03%         | 5.83%         | 17.33%        | 20.72%        | 23.17%        | 24.30%        |
| B   | 1.45%         | 9.40%         | 27.66%        | 35.33%        | 36.45%        | 38.72%        | 38.72%        |
| Caa   | NA            | NA            | NA            | NA            | NA            | NA            | NA            |
| Investment Grade  | 0.00%         | 0.04%         | 0.17%         | 0.91%         | 1.51%         | 1.92%         | 2.14%         |
| Speculative Grade   | 0.21%         | 2.27%         | 9.14%         | 20.06%        | 23.09%        | 25.58%        | 26.43%        |
| All Ratings   | 0.01%         | 0.10%         | 0.43%         | 1.51%         | 2.20%         | 2.68%         | 2.93%         |

| US RMBS excl '05-'07 vintages | 1-Year | 2-Year | 3-Year | 4-Year | 5-year | 6-Year | 7-year |
|-------------------------------|--------|--------|--------|--------|--------|--------|--------|
| Aaa                           | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| Aa                            | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.02%  | 0.02%  | 0.04%  |
| A                             | 0.00%  | 0.00%  | 0.16%  | 0.45%  | 0.63%  | 0.82%  | 0.82%  |
| Baa                           | 0.00%  | 0.00%  | 0.06%  | 2.13%  | 3.78%  | 4.20%  | 4.83%  |
| Ba                            | 0.00%  | 0.00%  | 0.32%  | 2.76%  | 5.39%  | 6.66%  | 7.01%  |
| B                             | 0.19%  | 0.24%  | 2.18%  | 4.32%  | 7.70%  | 9.65%  | 10.76% |
| Caa                           | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  |
| Investment Grade              | 0.00%  | 0.00%  | 0.01%  | 0.17%  | 0.30%  | 0.34%  | 0.39%  |
| Speculative Grade             | 0.07%  | 0.09%  | 1.01%  | 3.34%  | 6.23%  | 7.74%  | 8.35%  |
| All Ratings                   | 0.00%  | 0.00%  | 0.06%  | 0.32%  | 0.60%  | 0.72%  | 0.82%  |
| Global CDOs excl SF CDOs      | 1-Year | 2-Year | 3-Year | 4-Year | 5-year | 6-Year | 7-year |
| Aaa                           | 0.19%  | 0.40%  | 0.46%  | 0.70%  | 0.70%  | 0.70%  | 0.70%  |
| Aa                            | 0.07%  | 0.47%  | 0.73%  | 1.22%  | 1.35%  | 1.54%  | 1.65%  |
| A                             | 0.17%  | 1.84%  | 3.35%  | 3.95%  | 5.31%  | 7.45%  | 7.97%  |
| Baa                           | 0.27%  | 1.56%  | 3.93%  | 5.69%  | 7.09%  | 8.90%  | 9.44%  |
| Ba                            | 0.12%  | 1.99%  | 4.46%  | 6.05%  | 6.82%  | 7.34%  | 8.21%  |
| B                             | 2.04%  | 5.99%  | 17.36% | 24.78% | 27.30% | 29.70% | 29.70% |
| Caa                           | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | NA     | NA     |
| Investment Grade              | 0.18%  | 0.97%  | 1.89%  | 2.63%  | 3.27%  | 4.20%  | 4.46%  |
| Speculative Grade             | 0.30%  | 2.35%  | 5.69%  | 7.90%  | 8.97%  | 9.87%  | 10.61% |
| All Ratings                   | 0.19%  | 1.13%  | 2.33%  | 3.25%  | 3.96%  | 4.89%  | 5.23%  |

## Appendix V: One-Year Rating Transition Matrix with a Material Impairment Column

| Global Structured Finance | Aaa           | Aa            | A             | Baa           | Ba            | B             | Caa           | Material Impairment | WR     |
|---------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------------|--------|
| Aaa                       | <b>85.08%</b> | 0.80%         | 0.60%         | 0.42%         | 0.22%         | 0.16%         | 0.09%         | 0.19%               | 12.43% |
| Aa                        | 4.81%         | <b>80.66%</b> | 2.09%         | 1.24%         | 0.93%         | 2.01%         | 0.60%         | 1.52%               | 6.15%  |
| A                         | 0.93%         | 3.10%         | <b>79.10%</b> | 3.30%         | 1.42%         | 2.10%         | 1.23%         | 2.51%               | 6.30%  |
| Baa                       | 0.27%         | 0.41%         | 2.29%         | <b>77.78%</b> | 3.29%         | 2.79%         | 2.01%         | 5.57%               | 5.59%  |
| Ba                        | 0.11%         | 0.07%         | 0.37%         | 2.27%         | <b>77.18%</b> | 3.23%         | 2.38%         | 8.96%               | 5.43%  |
| B                         | 0.07%         | 0.03%         | 0.08%         | 0.29%         | 1.79%         | <b>79.00%</b> | 4.15%         | 9.83%               | 4.77%  |
| Caa                       | 0.10%         | 0.00%         | 0.00%         | 0.14%         | 0.31%         | 1.72%         | <b>63.28%</b> | 28.51%              | 5.95%  |
| US ABS excl HEL           | Aaa           | Aa            | A             | Baa           | Ba            | B             | Caa           | Material Impairment | WR     |
| Aaa                       | <b>82.89%</b> | 1.11%         | 0.76%         | 0.25%         | 0.07%         | 0.03%         | 0.02%         | 0.02%               | 14.84% |
| Aa                        | 2.37%         | <b>81.37%</b> | 3.78%         | 1.53%         | 0.49%         | 0.52%         | 0.20%         | 0.78%               | 8.96%  |
| A                         | 0.68%         | 2.41%         | <b>81.35%</b> | 3.59%         | 0.76%         | 0.34%         | 0.21%         | 0.30%               | 10.36% |
| Baa                       | 0.36%         | 0.41%         | 1.36%         | <b>82.43%</b> | 4.27%         | 1.23%         | 0.53%         | 1.47%               | 7.94%  |
| Ba                        | 0.08%         | 0.08%         | 0.30%         | 1.92%         | <b>73.03%</b> | 6.04%         | 3.38%         | 8.60%               | 6.57%  |
| B                         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | <b>75.46%</b> | 9.00%         | 12.59%              | 2.95%  |
| Caa                       | 0.00%         | 0.00%         | 0.00%         | 0.09%         | 0.26%         | 0.26%         | <b>69.48%</b> | 26.59%              | 3.33%  |
| US HEL                    | Aaa           | Aa            | A             | Baa           | Ba            | B             | Caa           | Material Impairment | WR     |
| Aaa                       | <b>80.07%</b> | 1.08%         | 0.85%         | 0.91%         | 0.27%         | 0.28%         | 0.15%         | 0.03%               | 16.34% |
| Aa                        | 1.67%         | <b>82.05%</b> | 2.59%         | 1.77%         | 1.44%         | 3.32%         | 0.97%         | 2.50%               | 3.69%  |
| A                         | 0.14%         | 1.44%         | <b>76.84%</b> | 5.48%         | 2.71%         | 4.24%         | 3.06%         | 3.34%               | 2.76%  |
| Baa                       | 0.02%         | 0.08%         | 0.68%         | <b>72.15%</b> | 5.13%         | 5.55%         | 4.92%         | 8.60%               | 2.86%  |
| Ba                        | 0.00%         | 0.04%         | 0.03%         | 0.47%         | <b>56.22%</b> | 6.32%         | 6.81%         | 27.92%              | 2.20%  |
| B                         | 0.00%         | 0.00%         | 0.12%         | 0.12%         | 0.22%         | <b>39.04%</b> | 3.80%         | 55.26%              | 1.45%  |
| Caa                       | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | <b>28.04%</b> | 68.60%              | 3.35%  |
| US RMBS                   | Aaa           | Aa            | A             | Baa           | Ba            | B             | Caa           | Material Impairment | WR     |
| Aaa                       | <b>88.02%</b> | 0.51%         | 0.51%         | 0.33%         | 0.24%         | 0.10%         | 0.02%         | 0.00%               | 10.27% |
| Aa                        | 6.34%         | <b>80.38%</b> | 1.26%         | 1.12%         | 1.05%         | 3.09%         | 0.64%         | 0.80%               | 5.32%  |
| A                         | 0.87%         | 3.84%         | <b>76.21%</b> | 2.63%         | 1.70%         | 4.53%         | 1.53%         | 3.96%               | 4.74%  |
| Baa                       | 0.20%         | 0.42%         | 3.33%         | <b>76.06%</b> | 2.18%         | 3.54%         | 1.43%         | 8.19%               | 4.66%  |
| Ba                        | 0.06%         | 0.12%         | 0.82%         | 4.57%         | <b>79.94%</b> | 1.32%         | 1.12%         | 7.06%               | 5.00%  |
| B                         | 0.00%         | 0.03%         | 0.12%         | 0.46%         | 4.18%         | <b>82.79%</b> | 0.71%         | 6.08%               | 5.64%  |
| Caa                       | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 2.53%         | 0.00%         | <b>29.05%</b> | 68.42%              | 0.00%  |

| US CMBS | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa    | Material Impairment | WR    |
|---------|--------|--------|--------|--------|--------|--------|--------|---------------------|-------|
| Aaa     | 90.54% | 0.30%  | 0.00%  | 0.00%  | 0.00%  | 0.01%  | 0.00%  | 0.00%               | 9.16% |
| Aa      | 16.84% | 75.93% | 0.57%  | 0.04%  | 0.02%  | 0.02%  | 0.00%  | 0.03%               | 6.55% |
| A       | 3.92%  | 9.97%  | 79.78% | 1.11%  | 0.21%  | 0.02%  | 0.00%  | 0.03%               | 4.95% |
| Baa     | 0.86%  | 1.22%  | 6.40%  | 82.62% | 1.65%  | 0.31%  | 0.06%  | 0.21%               | 6.67% |
| Ba      | 0.24%  | 0.02%  | 0.46%  | 2.94%  | 90.59% | 1.99%  | 0.21%  | 0.37%               | 3.19% |
| B       | 0.12%  | 0.02%  | 0.02%  | 0.15%  | 1.00%  | 91.44% | 3.92%  | 1.57%               | 1.78% |
| Caa     | 0.13%  | 0.00%  | 0.00%  | 0.00%  | 0.09%  | 1.12%  | 81.20% | 14.38%              | 3.07% |

| Global CDOs | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa    | Material Impairment | WR     |
|-------------|--------|--------|--------|--------|--------|--------|--------|---------------------|--------|
| Aaa         | 83.07% | 2.22%  | 1.20%  | 0.81%  | 0.84%  | 0.83%  | 0.75%  | 2.78%               | 7.51%  |
| Aa          | 1.95%  | 78.76% | 3.97%  | 1.89%  | 1.19%  | 0.94%  | 0.87%  | 3.73%               | 6.70%  |
| A           | 0.62%  | 1.67%  | 78.56% | 3.20%  | 1.52%  | 0.87%  | 0.81%  | 5.72%               | 7.03%  |
| Baa         | 0.19%  | 0.44%  | 1.13%  | 78.93% | 3.07%  | 1.57%  | 0.88%  | 7.32%               | 6.46%  |
| Ba          | 0.10%  | 0.08%  | 0.25%  | 1.28%  | 78.63% | 2.93%  | 2.25%  | 6.80%               | 7.67%  |
| B           | 0.00%  | 0.11%  | 0.23%  | 0.76%  | 2.47%  | 65.54% | 9.35%  | 12.14%              | 9.41%  |
| Caa         | 0.03%  | 0.00%  | 0.00%  | 0.41%  | 0.59%  | 2.86%  | 63.32% | 22.71%              | 10.08% |

| EMEA excl CDOs & Other | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa    | Material Impairment | WR     |
|------------------------|--------|--------|--------|--------|--------|--------|--------|---------------------|--------|
| Aaa                    | 86.04% | 0.45%  | 0.15%  | 0.21%  | 0.01%  | 0.01%  | 0.00%  | 0.00%               | 13.14% |
| Aa                     | 1.72%  | 86.82% | 0.34%  | 0.01%  | 0.00%  | 0.00%  | 0.03%  | 0.00%               | 11.09% |
| A                      | 0.28%  | 2.63%  | 87.91% | 0.49%  | 0.11%  | 0.00%  | 0.02%  | 0.00%               | 8.56%  |
| Baa                    | 0.06%  | 0.05%  | 2.03%  | 87.22% | 1.19%  | 0.15%  | 0.04%  | 0.03%               | 9.23%  |
| Ba                     | 0.23%  | 0.00%  | 0.21%  | 2.34%  | 85.82% | 2.83%  | 0.47%  | 0.06%               | 8.05%  |
| B                      | 0.95%  | 0.00%  | 0.00%  | 0.00%  | 0.95%  | 76.37% | 6.03%  | 0.56%               | 15.15% |
| Caa                    | 2.03%  | 0.00%  | 0.00%  | 0.00%  | 0.00%  | 2.03%  | 77.87% | 11.99%              | 6.08%  |

| Global SF excl SF CDOs, Other, and '05-'07 vintage US HEL & RMBS | Aaa    | Aa     | A      | Baa    | Ba     | B      | Caa    | Material Impairment | WR     |
|--|--------|--------|--------|--------|--------|--------|--------|---------------------|--------|
| Aaa  | 84.59% | 0.45%  | 0.27%  | 0.15%  | 0.02%  | 0.02%  | 0.01%  | 0.01%               | 14.48% |
| Aa   | 6.41%  | 83.06% | 1.55%  | 0.55%  | 0.17%  | 0.11%  | 0.06%  | 0.13%               | 7.95%  |
| A  | 1.17%  | 3.78%  | 83.76% | 2.37%  | 0.65%  | 0.25%  | 0.13%  | 0.20%               | 7.70%  |
| Baa  | 0.34%  | 0.51%  | 2.90%  | 83.80% | 2.79%  | 1.35%  | 0.47%  | 0.94%               | 6.90%  |
| Ba   | 0.14%  | 0.08%  | 0.46%  | 2.71%  | 83.65% | 2.74%  | 1.51%  | 2.61%               | 6.10%  |
| B  | 0.07%  | 0.03%  | 0.08%  | 0.32%  | 1.92%  | 82.98% | 4.20%  | 5.44%               | 4.95%  |
| Caa  | 0.11%  | 0.00%  | 0.00%  | 0.16%  | 0.22%  | 1.71%  | 70.01% | 21.14%              | 6.65%  |

| US HEL excl<br>'05-'07<br>vintages | Aaa           | Aa            | A             | Baa           | Ba            | B             | Caa           | Material<br>Impairment | WR     |
|------------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|------------------------|--------|
| Aaa                                | <b>80.76%</b> | 0.41%         | 0.36%         | 0.38%         | 0.02%         | 0.02%         | 0.01%         | 0.01%                  | 18.03% |
| Aa                                 | 2.61%         | <b>89.02%</b> | 1.70%         | 0.38%         | 0.03%         | 0.02%         | 0.00%         | 0.01%                  | 6.21%  |
| A                                  | 0.23%         | 2.20%         | <b>88.25%</b> | 3.43%         | 0.99%         | 0.29%         | 0.08%         | 0.17%                  | 4.35%  |
| Baa                                | 0.04%         | 0.13%         | 1.09%         | <b>83.89%</b> | 4.49%         | 3.25%         | 1.03%         | 1.68%                  | 4.41%  |
| Ba                                 | 0.00%         | 0.09%         | 0.06%         | 1.05%         | <b>74.31%</b> | 5.69%         | 4.85%         | 9.56%                  | 4.39%  |
| B                                  | 0.00%         | 0.00%         | 0.20%         | 0.20%         | 0.35%         | <b>59.01%</b> | 4.91%         | 32.94%                 | 2.38%  |
| Caa                                | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 0.00%         | <b>46.91%</b> | 47.43%                 | 5.66%  |

| US RMBS excl<br>'05-'07<br>vintages | Aaa           | Aa            | A             | Baa           | Ba            | B             | Caa           | Material<br>Impairment | WR     |
|-------------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|------------------------|--------|
| Aaa                                 | <b>86.33%</b> | 0.05%         | 0.02%         | 0.01%         | 0.00%         | 0.00%         | 0.00%         | 0.00%                  | 13.57% |
| Aa                                  | 9.34%         | <b>82.43%</b> | 0.24%         | 0.11%         | 0.01%         | 0.00%         | 0.00%         | 0.02%                  | 7.85%  |
| A                                   | 1.32%         | 5.80%         | <b>84.50%</b> | 0.58%         | 0.27%         | 0.13%         | 0.07%         | 0.12%                  | 7.21%  |
| Baa                                 | 0.31%         | 0.64%         | 5.03%         | <b>85.23%</b> | 0.77%         | 0.40%         | 0.12%         | 0.41%                  | 7.08%  |
| Ba                                  | 0.07%         | 0.14%         | 1.03%         | 5.68%         | <b>85.04%</b> | 0.55%         | 0.26%         | 1.03%                  | 6.18%  |
| B                                   | 0.00%         | 0.03%         | 0.13%         | 0.53%         | 4.77%         | <b>85.09%</b> | 0.40%         | 2.57%                  | 6.46%  |
| Caa                                 | 0.00%         | 0.00%         | 0.00%         | 0.00%         | 5.19%         | 0.00%         | <b>56.28%</b> | 38.53%                 | 0.00%  |

| Global CDOs<br>excl SF CDOs | Aaa           | Aa            | A             | Baa           | Ba            | B             | Caa           | Material<br>Impairment | WR     |
|-----------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|------------------------|--------|
| Aaa                         | <b>87.54%</b> | 1.75%         | 0.66%         | 0.23%         | 0.11%         | 0.07%         | 0.04%         | 0.05%                  | 9.56%  |
| Aa                          | 2.55%         | <b>82.63%</b> | 3.96%         | 1.67%         | 0.65%         | 0.27%         | 0.25%         | 0.14%                  | 7.87%  |
| A                           | 0.80%         | 1.75%         | <b>83.51%</b> | 3.11%         | 1.23%         | 0.59%         | 0.31%         | 0.38%                  | 8.31%  |
| Baa                         | 0.21%         | 0.47%         | 1.27%         | <b>83.87%</b> | 3.17%         | 1.47%         | 0.47%         | 1.28%                  | 7.79%  |
| Ba                          | 0.12%         | 0.10%         | 0.30%         | 1.23%         | <b>82.88%</b> | 2.81%         | 2.09%         | 1.90%                  | 8.58%  |
| B                           | 0.00%         | 0.12%         | 0.26%         | 0.86%         | 2.55%         | <b>68.74%</b> | 9.06%         | 8.15%                  | 10.26% |
| Caa                         | 0.04%         | 0.00%         | 0.00%         | 0.50%         | 0.24%         | 2.54%         | <b>68.50%</b> | 16.50%                 | 11.68% |

## Moody's Related Research

### Special Comments:

- Default & Loss Rates of Structured Finance Securities: 1993-2007, July 2008 (109707)
- Default & Loss Rates of Structured Finance Securities: 1993-2006, April 2007 (102733)
- Default & Loss Rates of Structured Finance Securities: 1993-2005, April 2006 (97234)
- Default & Loss Rates of Structured Finance Securities: 1993-2004, July 2005 (93653)
- Default & Loss Rates of Structured Finance Securities: 1993-2003, September 2004 (88692)
- Default & Loss Rates of U.S. CDOs: 1993-2003, March 2005 (91692)
- Measuring Loss-Given-Default for Structured Finance Securities: An Update, December 2006 (101284)
- Measuring Loss Severity Rates of Defaulted Residential Mortgage Backed Securities: A Methodology, April 2004 (86769)
- Payment Defaults and Material Impairments of U.S. Structured Finance Securities: 1993-2002, December 2003 (80247)
- Structured Finance Rating Transitions: 1983-2008, March 2009 (115157)
- Japanese Structured Finance Rating Transitions: 1994-2008, March 2009 (115070)
- Asia-Pacific (ex-Japan) Structured Finance Rating Transitions: 1990-2008, March 2009 (115165)
- EMEA Structured Finance Rating Transitions: 1988-2008, April 2009 (116507)
- The Performance of Structured Finance Ratings: Mid-Year 2008 Report, November 2008 (112347)
- Deal Sponsor and Credit Risk of U.S. ABS and MBS Securities, December 2006 (100872)
- The Relationship between Par Coupon Spreads and Credit Ratings in US Structured Finance, December 2005 (95494)
- Structured Finance Watchlist Resolutions: 1992-2003, June 2004 (87305)
- Corporate Default and Recovery Rates, 1920-2008, February 2009 (114844)
- Guide to Moody's Default Research: June 2009 Update, June 2009 (118044)

*To access any of these reports, click on the entry above. Note that these references are current as of the date of publication of this report and that more recent reports may be available. All research may not be available to all clients.*

Report Number: 119617

**Author**  
Julia Tung

**Senior Production Associate**  
Wendy Kroeker



**Moody's Investors Service**