



# The Evolution of the Subprime Mortgage Market

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This paper describes subprime lending in the mortgage market and how it has evolved through time. Subprime lending has introduced a substantial amount of risk-based pricing into the mortgage market by creating a myriad of prices and product choices largely determined by borrower credit history (mortgage and rental payments, foreclosures and bankruptcies, and overall credit scores) and down payment requirements. Although subprime lending still differs from prime lending in many ways, much of the growth (at least in the securitized portion of the market) has come in the least-risky (A-) segment of the market. In addition, lenders have imposed prepayment penalties to extend the duration of loans and required larger down payments to lower their credit risk exposure from high-risk loans.

Federal Reserve Bank of St. Louis *Review*, January/February 2006, 88(1), pp. 31-56.

## INTRODUCTION AND MOTIVATION

**H**omeownership is one of the primary ways that households can build wealth. In fact, in 1995, the typical household held no corporate equity (Tracy, Schneider, and Chan, 1999), implying that most households find it difficult to invest in anything but their home. Because homeownership is such a significant economic factor, a great deal of attention is paid to the mortgage market.

Subprime lending is a relatively new and rapidly growing segment of the mortgage market that expands the pool of credit to borrowers who, for a variety of reasons, would otherwise be denied credit. For instance, those potential borrowers who would fail credit history requirements in the standard (prime) mortgage market have greater access to credit in the subprime market. Two of the major benefits of this type of lending, then, are the increased numbers of homeowners and the opportunity for these homeowners to create wealth.

Of course, this expanded access comes with a price: At its simplest, subprime lending can be described as high-cost lending.

Borrower cost associated with subprime lending is driven primarily by two factors: credit history and down payment requirements. This contrasts with the prime market, where borrower cost is primarily driven by the down payment alone, given that minimum credit history requirements are satisfied.

Because of its complicated nature, subprime lending is simultaneously viewed as having great promise and great peril. The promise of subprime lending is that it can provide the opportunity for homeownership to those who were either subject to discrimination or could not qualify for a mortgage in the past.<sup>1</sup> In fact, subprime lending is most

<sup>1</sup> See Hillier (2003) for a thorough discussion of the practice of “redlining” and the lack of access to lending institutions in predominately minority areas. In fact, in the 1930s the Federal Housing Authority (FHA) explicitly referred to African Americans and other minority groups as adverse influences. By the 1940s, the Justice Department had filed criminal and civil antitrust suits to stop redlining.

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prevalent in neighborhoods with high concentrations of minorities and weaker economic conditions (Calem, Gillen, and Wachter, 2004, and Pennington-Cross, 2002). However, because poor credit history is associated with substantially more delinquent payments and defaulted loans, the interest rates for subprime loans are substantially higher than those for prime loans.

Preliminary evidence indicates that the probability of default is at least six times higher for nonprime loans (loans with high interest rates) than prime loans. In addition, nonprime loans are less sensitive to interest rate changes and, as a result, subprime borrowers have a harder time taking advantage of available cheaper financing (Pennington-Cross, 2003, and Capozza and Thomson, 2005). The Mortgage Bankers Association of America (MBAA) reports that subprime loans in the third quarter of 2002 had a delinquency rate 5½ times higher than that for prime loans (14.28 versus 2.54 percent) and the rate at which foreclosures were begun for subprime loans was more than 10 times that for prime loans (2.08 versus 0.20 percent). Therefore, the propensity of borrowers of subprime loans to fail as homeowners (default on the mortgage) is much higher than for borrowers of prime loans.

This failure can lead to reduced access to financial markets, foreclosure, and loss of any equity and wealth achieved through mortgage payments and house price appreciation. In addition, any concentration of foreclosed property can potentially adversely impact the value of property in the neighborhood as a whole.

Traditionally, the mortgage market set minimum lending standards based on a borrower's income, payment history, down payment, and the local underwriter's knowledge of the borrower. This approach can best be characterized as using nonprice credit rationing. However, the subprime market has introduced many different pricing tiers and product types, which has helped to move the mortgage market closer to price rationing, or risk-based pricing. The success of the subprime market will in part determine how fully the mortgage market eventually incorporates pure price rationing (i.e., risk-based prices for each borrower).

This paper provides basic information about

subprime lending and how it has evolved, to aid the growing literature on the subprime market and related policy discussions. We use data from a variety of sources to study the subprime mortgage market: For example, we characterize the market with detailed information on 7.2 million loans leased from a private data provider called LoanPerformance. With these data, we analyze the development of subprime lending over the past 10 years and describe what the subprime market looks like today. We pay special attention to the role of credit scores, down payments, and prepayment penalties.

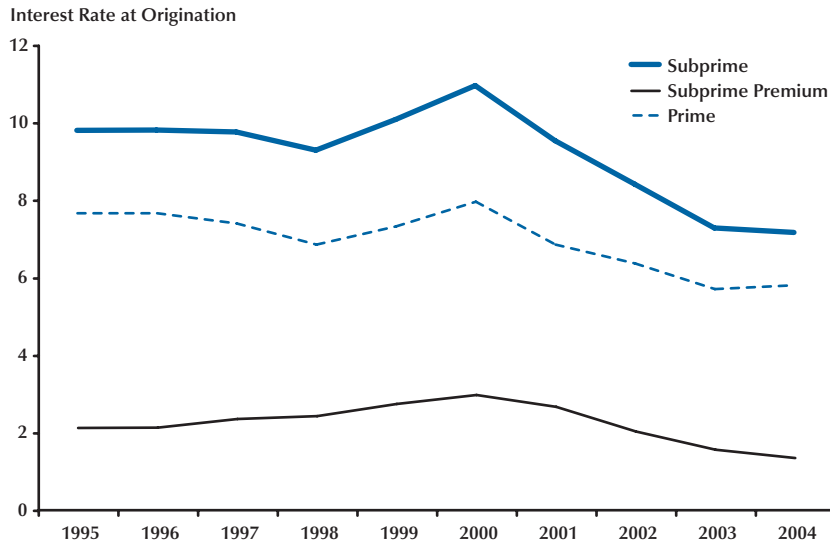
The results of our analysis indicate that the subprime market has grown substantially over the past decade, but the path has not been smooth. For instance, the market expanded rapidly until 1998, then suffered a period of retrenchment, but currently seems to be expanding rapidly again, especially in the least-risky segment of the subprime market (A– grade loans). Furthermore, lenders of subprime loans have increased their use of mechanisms such as prepayment penalties and large down payments to, respectively, increase the duration of loans and mitigate losses from defaulted loans.

## **WHAT MAKES A LOAN SUBPRIME?**

From the borrower's perspective, the primary distinguishing feature between prime and subprime loans is that the upfront and continuing costs are higher for subprime loans. Upfront costs include application fees, appraisal fees, and other fees associated with originating a mortgage. The continuing costs include mortgage insurance payments, principle and interest payments, late fees and fines for delinquent payments, and fees levied by a locality (such as property taxes and special assessments).

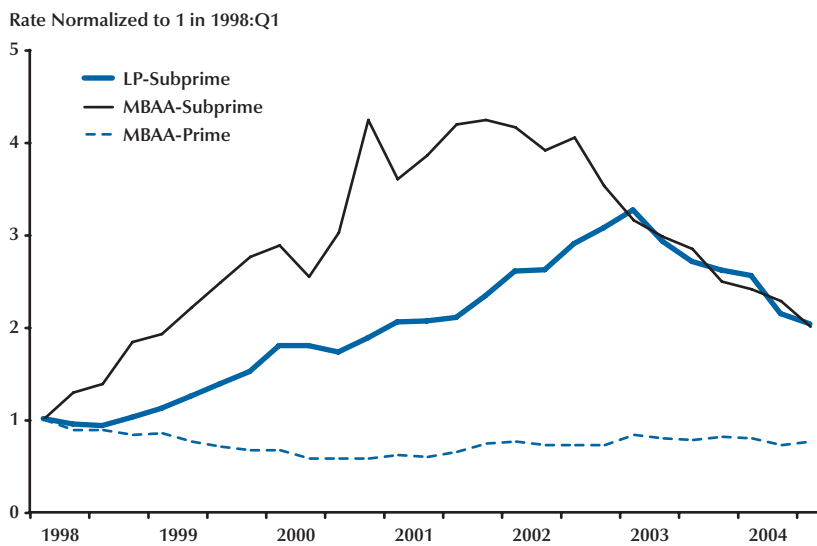
Very little data have been gathered on the extent of upfront fees and how they differ from prime fees. But, as shown by Fortowsky and LaCour-Little (2002), many factors, including borrower credit history and prepayment risk, can substantially affect the pricing of loans. Figure 1 compares interest rates for 30-year fixed-rate loans in the prime and the subprime markets. The

**Figure 1**  
**Interest Rates**



NOTE: Prime is the 30-year fixed interest rate reported by the Freddie Mac Primary Mortgage Market Survey. Subprime is the average 30-year fixed interest rate at origination as calculated from the LoanPerformance data set. The Subprime Premium is the difference between the prime and subprime rates.

**Figure 2**  
**Foreclosures In Progress**



NOTE: The rate of foreclosure in progress is normalized to 1 in the first quarter of 1998. MBAA indicates the source is the Mortgage Bankers Association of America and LP indicates that the rate is calculated from the LoanPerformance ABS data set.

**Table 1****Underwriting and Loan Grades**

Credit history	Premier Plus	Premier	A-	B	C	C-
Mortgage delinquency in days	0 x 30 x 12	1 x 30 x 12	2 x 30 x 12	1 x 60 x 12	1 x 90 x 12	2 x 90 x 12
Foreclosures	>36 months	>36 months	>36 months	>24 months	>12 months	>1 day
Bankruptcy, Chapter 7	Discharged >36 months	Discharged >36 months	Discharged >36 months	Discharged >24 months	Discharged >12 months	Discharged
Bankruptcy, Chapter 13	Discharged >24 months	Discharged >24 months	Discharged >24 months	Discharged >18 months	Filed >12 months	Pay
Debt ratio	50%	50%	50%	50%	50%	50%

SOURCE: Countrywide, downloaded from [www.cwbc.com](http://www.cwbc.com) on 2/11/05.

prime interest rate is collected from the Freddie Mac Primary Mortgage Market Survey. The subprime interest rate is the average 30-year fixed-rate at origination as calculated from the LoanPerformance data set. The difference between the two in each month is defined as the subprime premium. The premium charged to a subprime borrower is typically around 2 percentage points. It increases a little when rates are higher and decreases a little when rates are lower.

From the lender's perspective, the cost of a subprime loan is driven by the loan's termination profile.<sup>2</sup> The MBAA reports (through the MBAA delinquency survey) that 4.48 percent of subprime and 0.42 percent of prime fixed-rate loans were in foreclosure during the third quarter of 2004. According to LoanPerformance data, 1.55 percent of fixed-rate loans were in foreclosure during the same period. (See the following section "Evolution of Subprime Lending" for more details on the differences between these two data sources.) Figure 2 depicts the prime and subprime loans in foreclosure from 1998 to 2004. For comparison, the rates are all normalized to 1 in the first quarter of 1998 and only fixed-rate loans are included.

The figure shows that foreclosures on prime loans declined slightly from 1998 through the third quarter of 2004. In contrast, both measures of subprime loan performance showed substan-

tial increases. For example, from the beginning of the sample to their peaks, the MBAA measure increased nearly fourfold and the LoanPerformance measure increased threefold. Both measures have been declining since 2003. These results show that the performance and termination profiles for subprime loans are much different from those for prime loans, and after the 2001 recession it took nearly two years for foreclosure rates to start declining in the subprime market. It is also important to note that, after the recession, the labor market weakened but the housing market continued to thrive (high volume with steady and increasing prices). Therefore, there was little or no equity erosion caused by price fluctuations during the recession. It remains to be seen how subprime loans would perform if house prices declined while unemployment rates increased.

The rate sheets and underwriting matrices from Countrywide Home Loans, Inc. (download from [www.cwbc.com](http://www.cwbc.com) on 2/11/05), a leading lender and servicer of prime and subprime loans, provide some details typically used to determine what type of loan application meets subprime underwriting standards.

Countrywide reports six levels, or loan grades, in its B&C lending rate sheet: Premier Plus, Premier, A-, B, C, and C-. The loan grade is determined by the applicant's mortgage or rent payment history, bankruptcies, and total debt-to-income ratio. Table 1 provides a summary of the four

<sup>2</sup> The termination profile determines the likelihood that the borrower will either prepay or default on the loan.

**Table 2**  
**Underwriting and Interest Rates**

Loan grade	Credit score	LTV				
		60%	70%	80%	90%	100%
Premier Plus	680	5.65	5.75	5.80	5.90	7.50
	660	5.65	5.75	5.85	6.00	7.85
	600	5.75	5.80	5.90	6.60	8.40
	580	5.75	5.85	6.00	6.90	8.40
	500	6.40	6.75	7.90		
Premier	680	5.80	5.90	5.95	5.95	7.55
	660	5.80	5.90	6.00	6.05	7.90
	600	5.90	5.95	6.05	6.65	8.45
	580	5.90	6.00	6.15	6.95	
	500	6.55	6.90	8.05		
A–	680					
	660	6.20	6.25	6.35	6.45	
	600	6.35	6.45	6.50	6.70	
	580	6.35	6.45	6.55	7.20	
	500	6.60	6.95	8.50		
B	680					
	660	6.45	6.55	6.65		
	600	6.55	6.60	6.75		
	580	6.55	6.65	6.85		
	500	6.75	7.25	9.20		
C	680					
	660					
	600	6.95	7.20			
	580	7.00	7.30			
	500	7.45	8.95			
C–	680					
	660					
	600					
	580	7.40	7.90			
	500	8.10	9.80			

NOTE: The first three years are at a fixed interest rate, and there is a three-year prepayment penalty.

SOURCE: Countrywide California B&C Rate Sheet, downloaded from [www.cwbc.com](http://www.cwbc.com) on 2/11/05.

underwriting requirements used to determine the loan grade. For example, to qualify for the Premier Plus grade, the applicant may have had no mortgage payment 30 days or more delinquent in the past year (0 x 30 x 12). The requirement is

slowly relaxed for each loan grade: the Premier grade allows one payment to be 30-days delinquent; the A– grade allows two payments to be 30-days delinquent; the B grade allows one payment to be 60-days delinquent; the C grade allows

one payment to be 90-days delinquent; and the C- grade allows two payments to be 90-days delinquent. The requirements for foreclosures are also reduced for the lower loan grades. For example, whereas the Premier Plus grade stipulates no foreclosures in the past 36 months, the C grade stipulates no foreclosures only in the past 12 months, and the C- grade stipulates no active foreclosures. For most loan grades, Chapter 7 and Chapter 13 bankruptcies typically must have been discharged at least a year before application; however, the lowest grade, C-, requires only that Chapter 7 bankruptcies have been discharged and Chapter 13 bankruptcies at least be in repayment. However, all loan grades require at least a 50 percent ratio between monthly debt servicing costs (which includes all outstanding debts) and monthly income.

Loan grade alone does not determine the cost of borrowing (that is, the interest rate on the loan). Table 2 provides a matrix of credit scores and loan-to-value (LTV) ratio requirements that determine pricing of the mortgage within each loan grade for a 30-year loan with a 3-year fixed interest rate and a 3-year prepayment penalty. For example, loans in the Premier Plus grade with credit scores above 680 and down payments of 40 percent or more would pay interest rates of 5.65 percentage points, according to the Countrywide rate sheet for California. As the down payment gets smaller (as LTV goes up), the interest rate increases. For example, an applicant with the same credit score and a 100 percent LTV will be charged a 7.50 interest rate. But, note that the interest rate is fairly stable until the down payment drops below 10 percent. At this point the lender begins to worry about possible negative equity positions in the near future due to appraisal error or price depreciation.

It is the combination of smaller down payments and lower credit scores that lead to the highest interest rates. In addition, applicants in lower loan grades tend to pay higher interest rates than similar applicants in a higher loan grade. This extra charge reflects the marginal risk associated with missed mortgage payments, foreclosures, or bankruptcies in the past. The highest rate

quoted is 9.8 percentage points for a C- grade loan with the lowest credit score and a 30 percent down payment.

The range of interest rates charged indicates that the subprime mortgage market actively price discriminates (that is, it uses risk-based pricing) on the basis of multiple factors: delinquent payments, foreclosures, bankruptcies, debt ratios, credit scores, and LTV ratios. In addition, stipulations are made that reflect risks associated with the loan grade and include any prepayment penalties, the length of the loan, the flexibility of the interest rate (adjustable, fixed, or hybrid), the lien position, the property type, and other factors.

The lower the grade or credit score, the larger the down payment requirement. This requirement is imposed because loss severities are strongly tied to the amount of equity in the home (Pennington-Cross, forthcoming) and price appreciation patterns.

As shown in Table 2, not all combinations of down payments and credit scores are available to the applicant. For example, Countrywide does not provide an interest rate for A- grade loans with no down payment (LTV = 100 percent). Therefore, an applicant qualifying for grade A- but having no down payment must be rejected. As a result, subprime lending rations credit through a mixture of risk-based pricing (price rationing) and minimum down payment requirements, given other risk characteristics (nonprice rationing).

In summary, in its simplest form, what makes a loan subprime is the existence of a premium above the prevailing prime market rate that a borrower must pay. In addition, this premium varies over time, which is based on the expected risks of borrower failure as a homeowner and default on the mortgage.

## **A BRIEF HISTORY OF SUBPRIME LENDING**

It was not until the mid- to late 1990s that the strong growth of the subprime mortgage market gained national attention. Immergluck and Wiles (1999) reported that more than half of subprime

**Table 3****Total Originations—Consolidation and Growth**

Year	Total B&C originations (billions)	Top 25 B&C originations (billions)	Top 25 market share of B&C	Total originations	B&C market share of total
1995	\$65.0	\$25.5	39.3%	\$639.4	10.2%
1996	\$96.8	\$45.3	46.8%	\$785.3	12.3%
1997	\$124.5	\$75.1	60.3%	\$859.1	14.5%
1998	\$150.0	\$94.3	62.9%	\$1,450.0	10.3%
1999	\$160.0	\$105.6	66.0%	\$1,310.0	12.2%
2000	\$138.0	\$102.2	74.1%	\$1,048.0	13.2%
2001	\$173.3	\$126.8	73.2%	\$2,058.0	8.4%
2002	\$213.0	\$187.6	88.1%	\$2,680.0	7.9%
2003	\$332.0	\$310.1	93.4%	\$3,760.0	8.8%

SOURCE: *Inside B&C Lending*. Individual firm data are from *Inside B&C Lending* and are generally based on security issuance or previously reported data.

refinances<sup>3</sup> originated in predominately African-American census tracts, whereas only one tenth of prime refinances originated in predominately African-American census tracts. Nichols, Pennington-Cross, and Yezer (2005) found that credit-constrained borrowers with substantial wealth are most likely to finance the purchase of a home by using a subprime mortgage.

The growth of subprime lending in the past decade has been quite dramatic. Using data reported by the magazine *Inside B&C Lending*, Table 3 reports that total subprime or B&C originations (loans) have grown from \$65 billion in 1995 to \$332 billion in 2003. Despite this dramatic growth, the market share for subprime loans (referred to in the table as B&C) has dropped from a peak of 14.5 percent in 1997 to 8.8 percent in 2003. During this period, homeowners refinanced existing mortgages in surges as interest rates dropped. Because subprime loans tend to be less responsive to changing interest rates (Pennington-Cross, 2003), the subprime market share should tend to drop during refinancing booms.

The financial markets have also increasingly securitized subprime loans. Table 4 provides the

securitization rates calculated as the ratio of the total number of dollars securitized divided by the number of dollars originated in each calendar year. Therefore, this number roughly approximates the actual securitization rate, but could be under or over the actual rate due to the packaging of seasoned loans.<sup>4</sup> The subprime loan securitization rate has grown from less than 30 percent in 1995 to over 58 percent in 2003. The securitization rate for conventional and jumbo loans has also increased over the same time period.<sup>5</sup> For example, conventional securitization rates have increased from close to 50 percent in 1995-97 to more than 75 percent in 2003. In addition, all or almost all of the loans insured by government loans are securitized. Therefore, the subprime mortgage market has become more similar to the prime market over time. In fact, the 2003 securitization rate of subprime loans is comparable to that of prime loans in the mid-1990s.

<sup>4</sup> Seasoned loans refers to loans sold into securities after the date of origination.

<sup>5</sup> Conventional loans are loans that are eligible for purchase by Fannie Mae and Freddie Mac because of loan size and include loans purchased by Fannie Mae and Freddie Mac, as well as those held in a portfolio or that are securitized through a private label. Jumbo loans are loans with loan amounts above the government-sponsored enterprise (conventional conforming) loan limit.

<sup>3</sup> A refinance is a new loan that replaces an existing loan, typically to take advantage of a lower interest rate on the mortgage.

**Table 4****Securitization Rates**

Year	Loan type			
	FHA/VA	Conventional	Jumbo	Subprime
1995	101.1%	45.6%	23.9%	28.4%
1996	98.1%	52.5%	21.3%	39.5%
1997	100.7%	45.9%	32.1%	53.0%
1998	102.3%	62.2%	37.6%	55.1%
1999	88.1%	67.0%	30.1%	37.4%
2000	89.5%	55.6%	18.0%	40.5%
2001	102.5%	71.5%	31.4%	54.7%
2002	92.6%	72.8%	32.0%	57.6%
2003	94.9%	75.9%	35.1%	58.7%

NOTE: Subprime securities include both MBS and ABS backed by subprime loans. Securitization rate = securities issued divided by originations in dollars.

SOURCE: *Inside MBS & ABS*.

Many factors have contributed to the growth of subprime lending. Most fundamentally, it became legal. The ability to charge high rates and fees to borrowers was not possible until the Depository Institutions Deregulation and Monetary Control Act (DIDMCA) was adopted in 1980. It preempted state interest rate caps. The Alternative Mortgage Transaction Parity Act (AMTPA) in 1982 permitted the use of variable interest rates and balloon payments.

These laws opened the door for the development of a subprime market, but subprime lending would not become a viable large-scale lending alternative until the Tax Reform Act of 1986 (TRA). The TRA increased the demand for mortgage debt because it prohibited the deduction of interest on consumer loans, yet allowed interest deductions on mortgages for a primary residence as well as one additional home. This made even high-cost mortgage debt cheaper than consumer debt for many homeowners. In environments of low and declining interest rates, such as the late 1990s and early 2000s, cash-out refinancing<sup>6</sup> becomes a popular mechanism for homeowners to access

the value of their homes. In fact, slightly over one-half of subprime loan originations have been for cash-out refinancing.<sup>7</sup>

In addition to changes in the law, market changes also contributed to the growth and maturation of subprime loans. In 1994, for example, interest rates increased and the volume of originations in the prime market dropped. Mortgage brokers and mortgage companies responded by looking to the subprime market to maintain volume. The growth through the mid-1990s was funded by issuing mortgage-backed securities (MBS, which are sometimes also referred to as private label or as asset-backed securities [ABS]). In addition, subprime loans were originated mostly by nondepository and monoline finance companies.

During this time period, subprime mortgages were relatively new and apparently profitable, but the performance of the loans in the long run was not known. By 1997, delinquent payments and defaulted loans were above projected levels and an accounting construct called “gains-on sales

<sup>6</sup> Cash-out refinancing indicates that the new loan is larger than the old loan and the borrower receives the difference in cash.

<sup>7</sup> One challenge the subprime industry will face in the future is the need to develop business plans to maintain volume when interest rates rise. This will likely include a shift back to home equity mortgages and other second-lien mortgages.



**Table 5****Top Ten B&C Originators, Selected Years**

Rank	2003	2002
1	Ameriquest Mortgage, CA	Household Finance, IL
2	New Century, CA	CitiFinancial, NY
3	CitiFinancial, NY	Washington Mutual, WA
4	Household Finance, IL	New Century, CA
5	Option One Mortgage, CA	Option One Mortgage, CA
6	First Franklin Financial Corp, CA	Ameriquest Mortgage, DE
7	Washington Mutual, WA	GMAC-RFC, MN
8	Countrywide Financial, CA	Countrywide Financial, CA
9	Wells Fargo Home Mortgage, IA	First Franklin Financial Corp, CA
10	GMAC-RFC, MN	Wells Fargo Home Mortgage, IA
	2001	2000
1	Household Finance, IL	CitiFinancial Credit Co, MO
2	CitiFinancial, NY	Household Financial Services, IL
3	Washington Mutual, WA	Washington Mutual, WA
4	Option One Mortgage, CA	Bank of America Home Equity Group, NC
5	GMAC-RFC, MN	GMAC-RFC, MN
6	Countrywide Financial, CA	Option One Mortgage, CA
7	First Franklin Financial Corp, CA	Countrywide Financial, CA
8	New Century, CA	Conseco Finance Corp. (Green Tree), MN
9	Ameriquest Mortgage, CA	First Franklin, CA
10	Bank of America, NC	New Century, CA
	1996	
1	Associates First Capital, TX	
2	The Money Store, CA	
3	ContiMortgage Corp, PA	
4	Beneficial Mortgage Corp, NJ	
5	Household Financial Services, IL	
6	United Companies, LA	
7	Long Beach Mortgage, CA	
8	EquiCredit, FL	
9	Aames Capital Corp., CA	
10	AMRESKO Residential Credit, NJ	

NOTE: B&C loans are defined as less than A quality non-agency (private label) paper loans secured by real estate. Subprime mortgage and home equity lenders were asked to report their origination volume by *Inside B&C Lending*. Wholesale purchases, including loans closed by correspondents, are counted.

SOURCE: *Inside B&C Lending*.

accounting” magnified the cost of the unanticipated losses. In hindsight, many lenders had underpriced subprime mortgages in the competitive and high-growth market of the early to mid-1990s (Temkin, Johnson, and Levy, 2002).

By 1998, the effects of these events also spilled over into the secondary market. MBS prices dropped, and lenders had difficulty finding investors to purchase the high-risk tranches. At or at about the same time, the 1998 Asian financial crisis greatly increased the cost of borrowing and again reduced liquidity in the all-real-estate markets. This impact can be seen in Table 4, where the securitization rate of subprime loans drops from 55.1 percent in 1998 to 37.4 percent in 1999. In addition, the volume of originations shown in Table 3 indicates that they dropped from \$105.6 billion in 1999 to \$102.2 billion in 2000. Both of these trends proved only transitory because both volume and securitization rates recovered in 2000-03.

Partially because of these events, the structure of the market also changed dramatically through the 1990s and early 2000s. The rapid consolidation of the market is shown in Table 3. For example, the market share of the top 25 firms making subprime loans grew from 39.3 percent in 1995 to over 90 percent in 2003.

Many firms that started the subprime industry either have failed or were purchased by larger institutions. Table 5 shows the top 10 originators for 2000-03 and 1996. From 2000 forward the list of top originators is fairly stable. For example, CitiFinancial, a member of Citigroup, appears each year, as does Washington Mutual and Countrywide Financial. The largest firms increasingly dominated the smaller firms from 2000 through 2003, when the market share of the top 25 originators increased from 74 percent to 93 percent.

In contrast, many of the firms in the top 25 in 1996 do not appear in the later time periods. This is due to a mixture of failures and mergers. For example, Associated First Capital was acquired by Citigroup and at least partially explains Citigroup’s position as one of the top originators and servicers of subprime loans. Long Beach Mortgage was purchased by Washington Mutual,

one of the nation’s largest thrifts. United Companies filed for bankruptcy, and Aames Capital Corporation was delisted after significant financial difficulties. Household Financial Services, one of the original finance companies, has remained independent and survived the period of rapid consolidation. In fact, in 2003 it was the fourth largest originator and number two servicer of loans in the subprime industry.

## **THE EVOLUTION OF SUBPRIME LENDING**

This section provides a detailed picture of the subprime mortgage market and how it has evolved from 1995 through 2004. We use individual loan data leased from LoanPerformance. The data track securities issued in the secondary market. Data sources include issuers, broker dealers/deal underwriters, servicers, master servicers, bond and trust administrators, trustees, and other third parties.

As of March 2003, more than 1,000 loan pools were included in the data. LoanPerformance estimates that the data cover over 61 percent of the subprime market. Therefore, it represents the segment of the subprime market that is securitized and could potentially differ from the subprime market as a whole. For example, the average rate of subprime loans in foreclosure reported by the LoanPerformance data is 35 percent of the rate reported by the MBAA. The MBAA, which does indicate that their sample of loans is not representative of the market, classifies loans as subprime based on lender name. The survey of lenders of prime and subprime loans includes approximately 140 participants. As will be noted later in the section, the LoanPerformance data set is dominated by the A-, or least risky, loan grade, which may in part explain the higher rate of foreclosures in the MBAA data. In addition, the demand for subprime securities should impact product mix.

The LoanPerformance data set provides a host of detailed information about individual loans that is not available from other data sources. (For example, the MBAA data report delinquency and foreclosure rates but do not indicate any information about the credit score of the borrower, down

payment, existence of prepayment penalties, or interest rate of the loan.<sup>8</sup>) The data set includes many of the standard loan application variables such as the LTV ratio, credit score, loan amount, term, and interest rate type. Some “cleaning” of the data is conducted. For example, in each tabulation, only available data are used. Therefore, each figure may represent a slightly different sample of loans. In addition, to help make the results more comparable across figures, only adjustable- and fixed-rate loans to purchase or refinance a home (with or without cash out) are included from January 1995 through the December of 2004. But because of the delay in data reporting, the estimates for 2004 will not include all loans from that year.

## Volume

Although the subprime mortgage market emerged in the early 1980s with the adoption of DIDMCA, AMTPA, and TRA, subprime lending rapidly grew only after 1995, when MBS with subprime-loan collateral become more attractive to investors. Figure 3 illustrates this pattern using our data (LoanPerformance) sample. In 1995, for example, the number of subprime fixed-rate mortgages (FRMs) originated was just slightly above 62,000 and the number of subprime adjustable-rate mortgages (ARMs) originated was just above 21,000. Since then, subprime lending has increased substantially, with the number of FRM originations peaking at almost 780,000 and ARM

originations peaking (and surpassing FRMs) at over 866,000.<sup>9</sup>

The subprime market took a temporary downturn when the total number of FRM subprime originations declined during the 1998-2000 period; this observation is consistent with our earlier brief history discussion and the downturn in originations reported by Inside Mortgage Finance (2004) and shown in Table 3. Since 2000, however, the subprime market has resumed its momentum. In fact, from 2002 to 2003 the LoanPerformance data show a 62 percent increase and the Inside Mortgage Finance data show a 56 percent increase in originations.

During the late 1990s, house prices increased and interest rates dropped to some of the lowest rates in 40 years, thus providing low-cost access to the equity in homes. Of the total number of subprime loans originated, just over one-half were for cash-out refinancing, whereas more than one-third were for a home purchase (see Figure 4). In 2003, for example, the total number of loans for cash-out refinancing was over 560,000, whereas the number of loans for a home purchase totaled more than 820,000, and loans for no-cash-out refinancing loans amounted to just under 250,000. In the prime market, Freddie Mac estimated that, in 2003, 36 percent of loans for refinancing took at least 5 percent of the loan in cash (downloaded from the Cash-Out Refi Report at [www.freddiemac.com/news/finance/data.html](http://www.freddiemac.com/news/finance/data.html) on 11/4/04). This estimate is in contrast with typical behavior in the subprime market, which always has had more cash-out refinancing than no-cash-out refinancing.

Given the characteristics of an application, lenders of subprime loans typically identify borrowers and classify them in separate risk categories. Figure 5 exhibits four risk grades, with A– being the least risky and D being the riskiest grade.<sup>10</sup> The majority of the subprime loan origi-

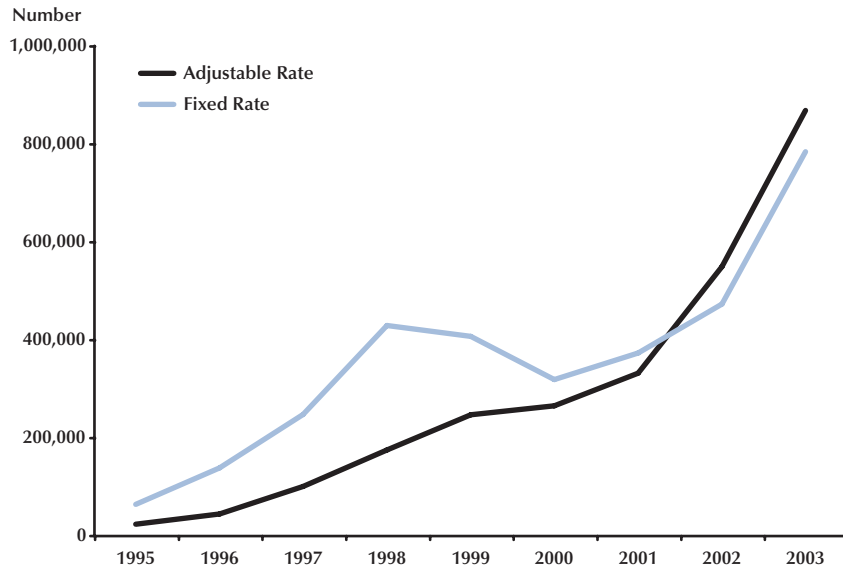
<sup>8</sup> An additional source of information on the subprime market is a list of lenders published by the United States Department of Housing and Urban Development (HUD) Policy Development and Research (PD&R). This list has varied from a low of 51 in 1993 to a high of 256 in 1996; in 2002, the last year available, 183 subprime lenders are identified. The list can then be matched to the Home Mortgage Disclosure Act (HMDA) data set. The list is compiled by examining trade publications and HMDA data analysis. Lenders with high denial rates and a high fraction of home refinances are potential candidates. The lenders are then called to confirm that they specialize in subprime lending. As a result, loans identified as subprime using the HUD list included only firms that specialize in subprime lending (not full-service lenders). As a result, many subprime loans will be excluded and some prime loans will be included in the sample. Very little detail beyond the interest rate of the loan and whether the rate is adjustable is included. For example, the existence of prepayment penalties is unknown—a unique and key feature of subprime lending. Still this lender list has proved useful in characterizing the neighborhood that these loans are originated in. See, for example, Pennington-Cross (2002) and Calem, Gillen, and Wachter (2004).

<sup>9</sup> Similarly, Nichols, Pennington-Cross, and Yezer (2005) note that the share of subprime mortgage lending in the overall mortgage market grew from 0.74 percent in the early 1990s to almost 9 percent by the end of 1990s.

<sup>10</sup> Loan grades are assigned by LoanPerformance and reflect only the rank ordering of any specific firm’s classifications. Because these classifications are not uniform, there will be mixing of loan qualities across grades. Therefore, these categories will likely differ from the Countrywide examples used earlier.

**Figure 3**

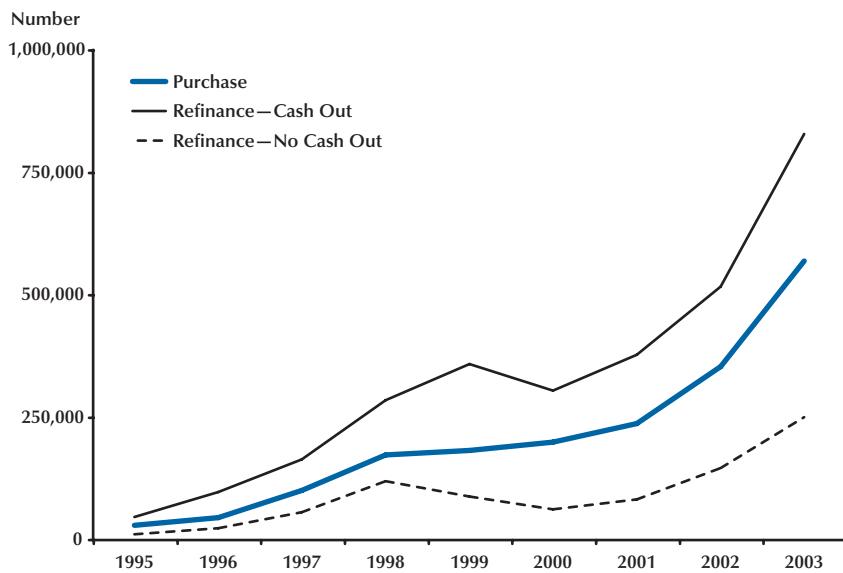
**Number of Loans Originated**



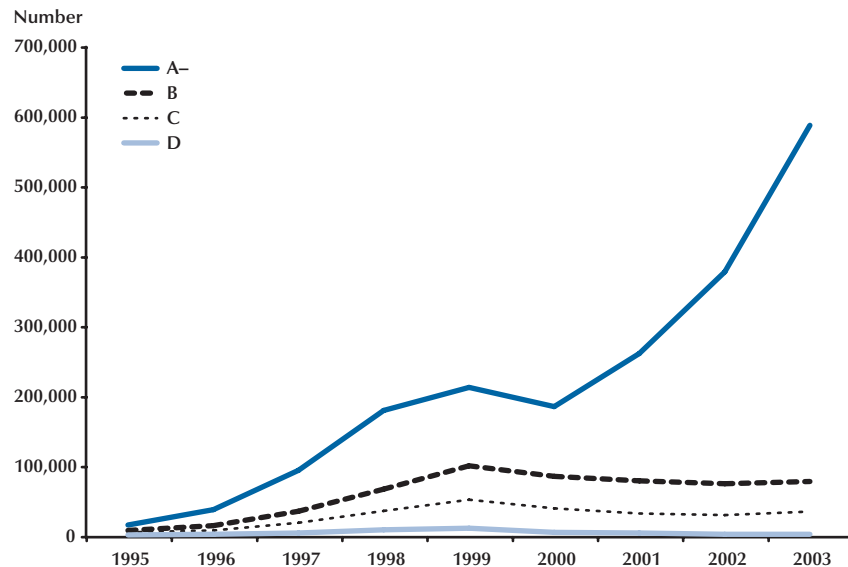
SOURCE: LoanPerformance ABS securities data base of subprime loans.

**Figure 4**

**Number of Loans Originated by Purpose**



SOURCE: LoanPerformance ABS securities data base of subprime loans.

**Figure 5****Number of Loans Originated by Grade**

SOURCE: LoanPerformance ABS securities data base of subprime loans.

nations in this data set are classified into the lowest identified risk category (grade A–), particularly after 1998. In addition, the proportion of grade A– loans to the total number of loans has continuously increased from slightly over 50 percent in 1995 to approximately 84 percent in 2003. On the other hand, the shares of grades B, C, and D loans have all declined since 2000. Overall, these observations illustrate that, since 1998–99, the subprime market (or at least the securitized segment of the market) has been expanding in its least-risky segment. It seems likely then that the move toward the A– segment of subprime loans is in reaction to (i) the events of 1998, (ii) the difficulty in correctly pricing the higher-risk segments (B, C, and D credit grades), and, potentially, (iii) changes in the demand for securities for subprime loans in the secondary market.

### Credit Scores

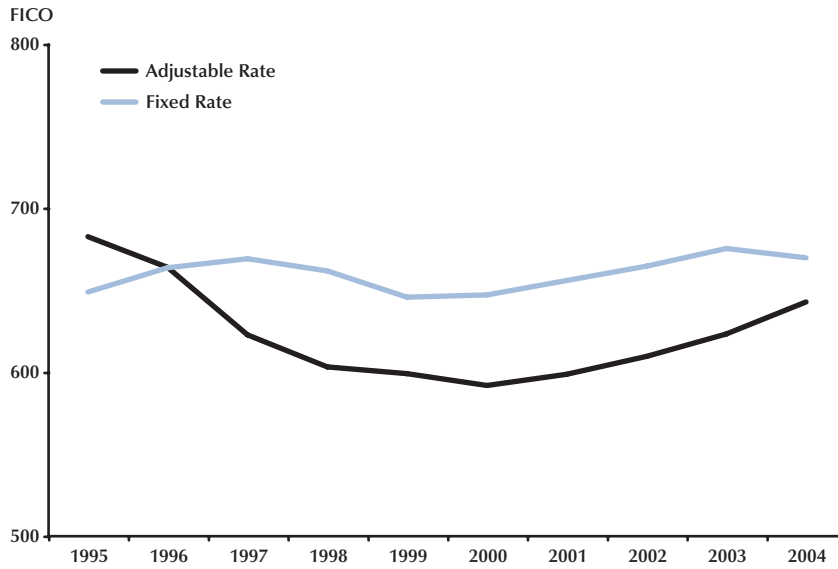
On average, ARM borrowers have lower credit scores than FRM borrowers (see Figure 6). In 2003, for example, the average FICO (a credit score

created by Fair Isaac Corporation to measure consumer credit worthiness) for FRMs is almost 50 points lower than for ARMs (623 versus 675). During the 1990s, average credit scores tended to decline each year, particularly for ARM borrowers; but since 2000, credit scores have tended to improve each year. Hence, it appears that subprime lenders expanded during the 1990s by extending credit to less-credit-worthy borrowers. Subsequently, the lower credit quality unexpectedly instigated higher delinquency and default rates (see also Temkin, Johnson, and Levy, 2002).

With the improved credit quality since 2000, the average FICO has jumped from just under 622 in 2000 to just over 651 in 2004 (closing in on the 669 average conventional FICO reported by Nichols, Pennington-Cross, and Yezer, 2005). As shown in Figure 7, lenders of subprime loans are increasing the number of borrowers with scores in the 500–600 and 700–800 ranges and decreasing the number with scores below 500. Specifically, from 2000 to 2003, the share of borrowers with FICO scores between 700 and 800 rose from approximately 14 percent to 22 percent.

**Figure 6**

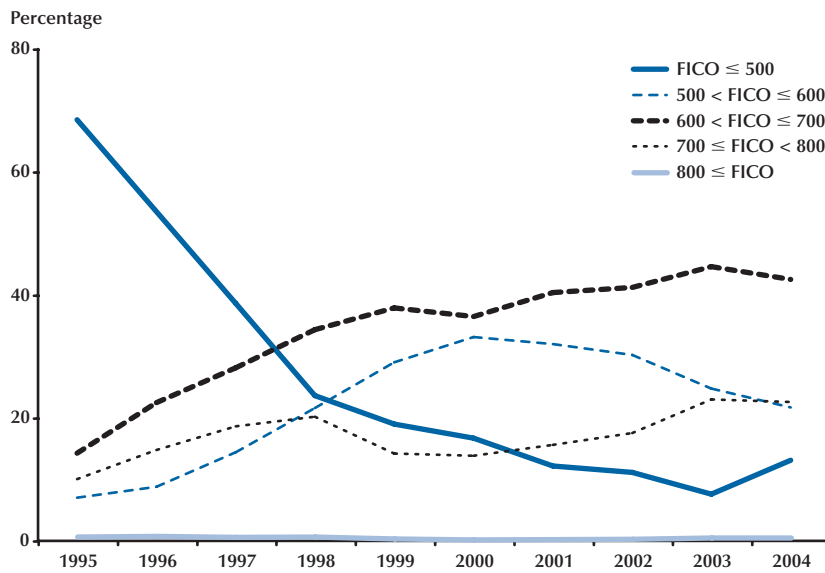
**Average Credit Score (FICO)**



SOURCE: LoanPerformance ABS securities data base of subprime loans.

**Figure 7**

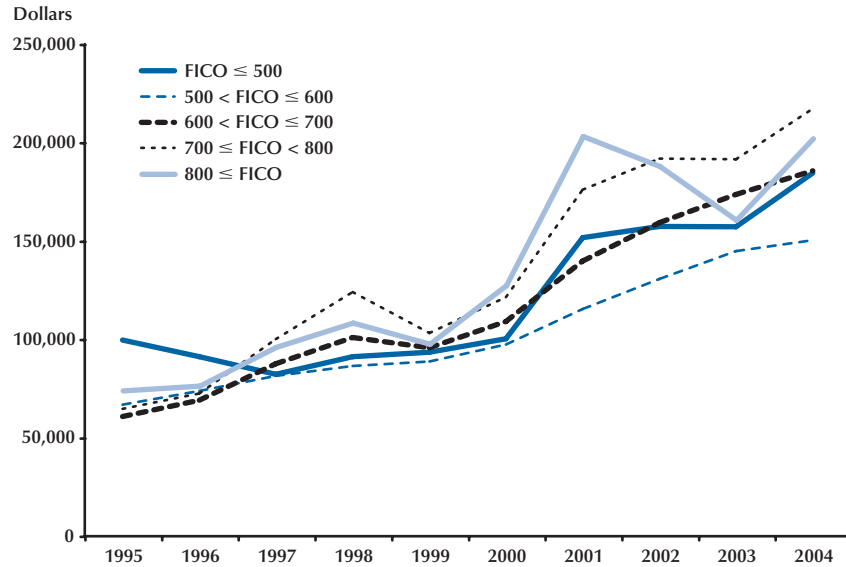
**Share of Loans by Credit Score**



SOURCE: LoanPerformance ABS securities data base of subprime loans.

**Figure 8**

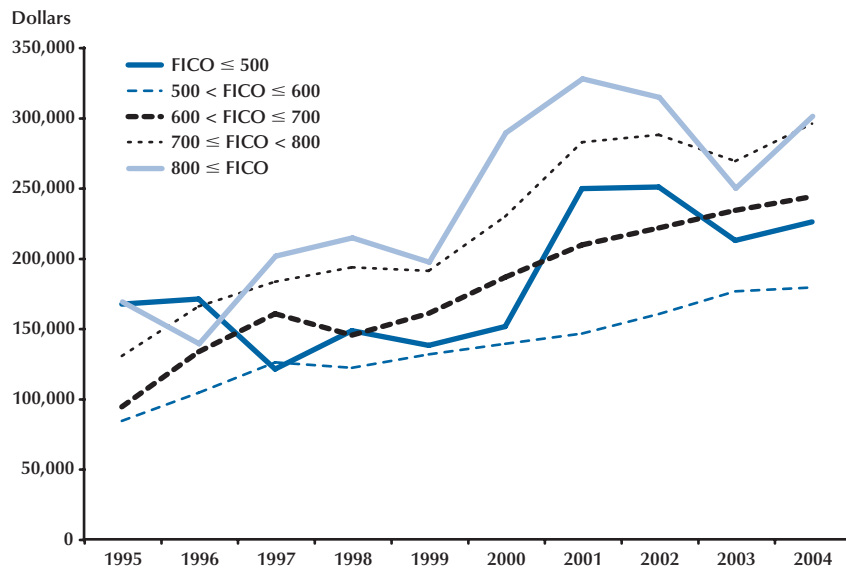
**Loan Amounts by Credit Score**



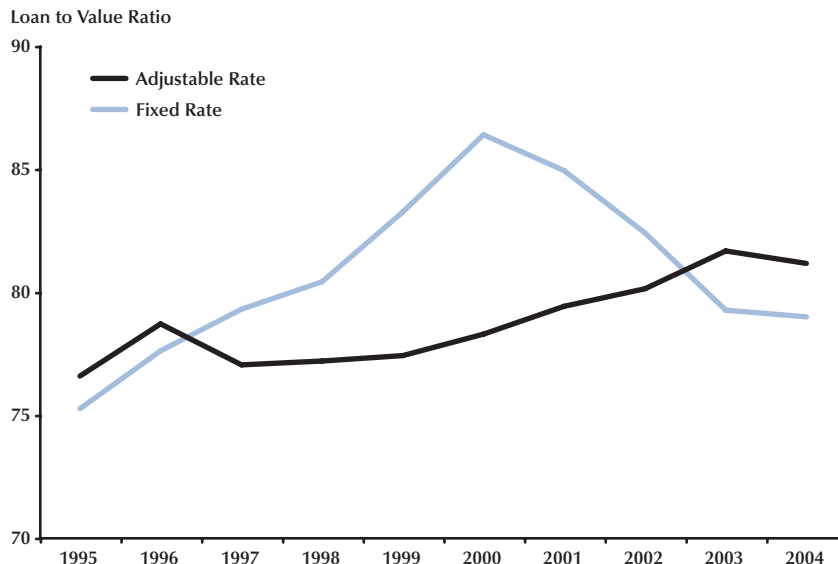
SOURCE: LoanPerformance ABS securities data base of subprime loans.

**Figure 9**

**House Prices by Credit Score**



SOURCE: LoanPerformance ABS securities data base of subprime loans.

**Figure 10****Loan to Value Ratio (LTV)**

SOURCE: LoanPerformance ABS securities data base of subprime loans.

Moreover, lenders have on average provided smaller loans to higher-risk borrowers, presumably to limit risk exposure (see Figure 8). As noted previously, these changes in underwriting patterns are consistent with lenders looking for new ways to limit risk exposure. In addition, although loan amounts have increased for all borrowers, the amounts have increased the most, on average, for borrowers with better credit scores. Also, as expected, borrowers with the best credit scores purchased the most expensive houses (see Figure 9).

**Down Payment**

Figure 10 depicts average LTV ratios for subprime loan originations over a 10-year period. The primary finding here is that down payments for FRMs were reduced throughout the 1990s but have increased steadily since. (Note that the change in business strategy occurs just after the 1998 crisis.) In contrast, over the same period, down payments for ARMs were reduced. On first inspection, it may

look like lenders are adding more risk by originating more ARMs with higher LTVs; however, this change primarily reflects borrowers with better credit scores and more loans classified as A-. Therefore, this is additional evidence that lenders of subprime loans reacted to the losses sustained in 1998 by moving to less-risky loans—primarily to borrowers with higher credit scores.

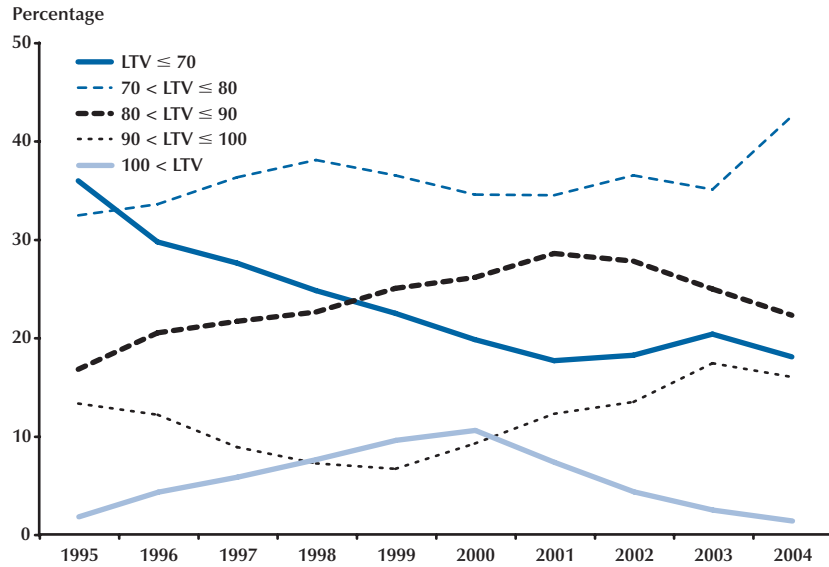
As shown in Figure 11, this shift in lending strategy was accomplished by (i) steadily reducing loans with a large down payment ( $LTV \leq 70$ ), (ii) decreasing loans with negative equity ( $LTV > 100$ ), and (iii) increasing loans with a 10 percent down payment. Overall, lenders of subprime loans have been increasing loan amounts, shifting the distribution of down payments, and increasing credit score requirements, on average, since 2000.

In general, borrowers with larger down payments tend to purchase more expensive homes (Figure 12). By tying the amount of the loan to the size of the down payment, lenders limit their exposure to credit risk.



**Figure 11**

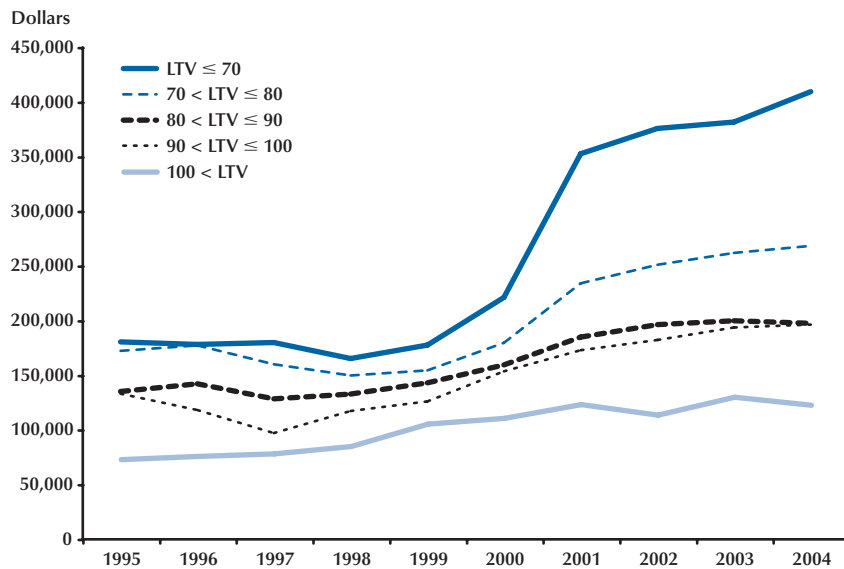
**Share of Loans by LTV**



SOURCE: LoanPerformance ABS securities data base of subprime loans.

**Figure 12**

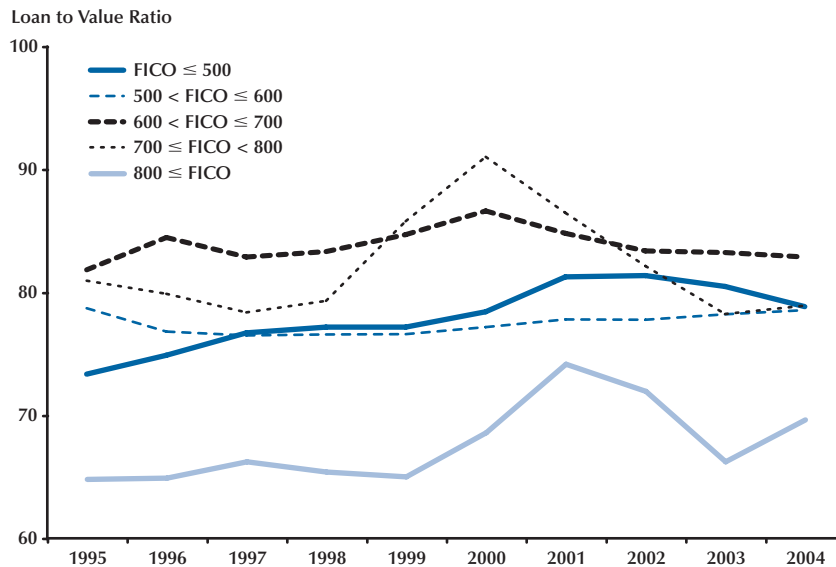
**House Prices by LTV**



SOURCE: LoanPerformance ABS securities data base of subprime loans.

## Figure 13

### LTV by Credit Score



SOURCE: LoanPerformance ABS securities data base of subprime loans.

### The LTV-FICO Trade-off

In Figure 13, we observe that borrowers with the best credit scores tend to also provide the largest down payments. But, beyond this observation, there seems little correlation between credit scores and down payments.

In contrast, Figure 14 shows a clear ordering of down payments (LTV ratios) by loan grade. Loans in higher loan grades have smaller down payments on average. In fact, over time, especially after 2000, the spread tends to increase. This finding is consistent with the philosophy that loans identified as being more risky must compensate lenders by providing larger down payments. This helps to reduce credit risk associated with trigger events, such as periods of unemployment and changes in household structure, which can make it difficult for borrowers to make timely payments.

Consistent with the loan grade classifications, Figure 15 shows that lower-grade loans have lower credit scores. Therefore, as loans move to better grades, credit scores improve and down payments decrease.

### INTEREST RATES

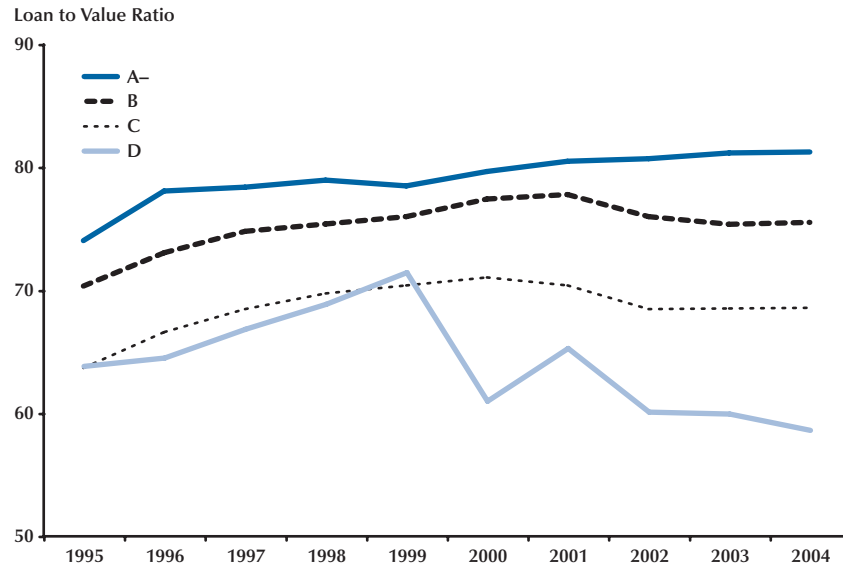
This section examines patterns in the interest rate that borrowers are charged at the origination of the loan. This does not reflect the full cost of borrowing because it does not include any fees and upfront costs that are borne by the borrower. In addition, the borrower can pay extra fees to lower the interest rate, which is called paying points.

Despite these stipulations, we are able to find relationships between the observed interest rates and underwriting characteristics. There is not much difference in the average interest rate (the interest rate on the loan excluding all upfront and continuing fees) at origination for FRMs and ARMs (see Figure 16). But, both product types have experienced a large drop in interest rates, from over 10 percent in 2000 to approximately 7 percent in 2004.

Underwriting standards usually rely heavily on credit history and LTVs to determine the appropriate risk-based price. In Figures 17 and 18 we see evidence of risk-based pricing based on bor-

**Figure 14**

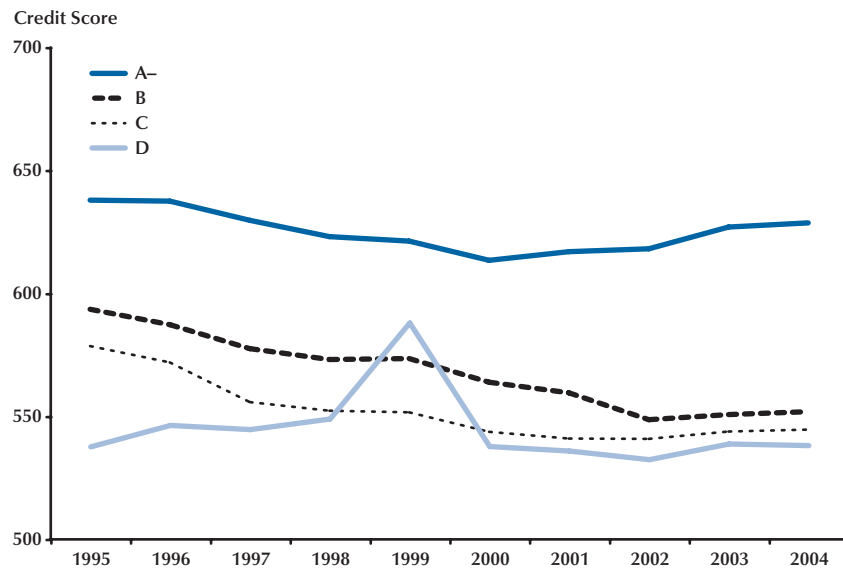
**LTV by Loan Grade**



SOURCE: LoanPerformance ABS securities data base of subprime loans.

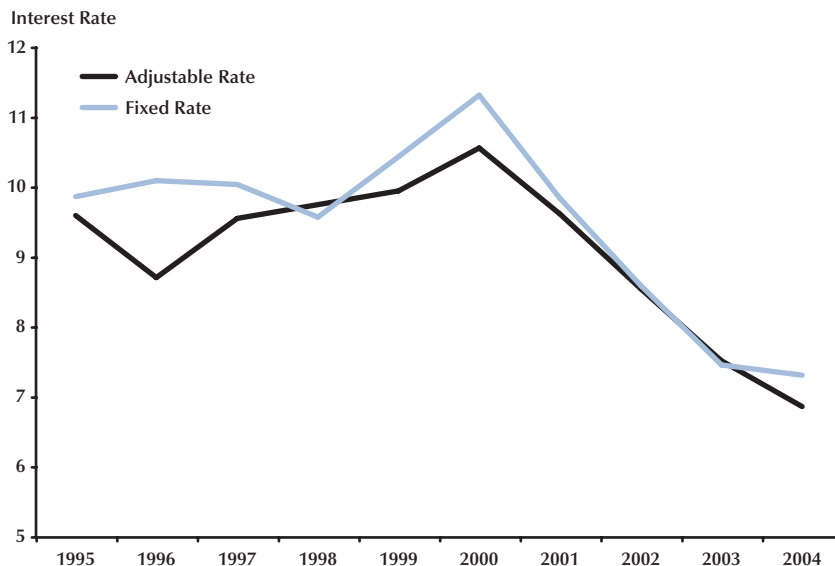
**Figure 15**

**Credit Score by Loan Grade**



SOURCE: LoanPerformance ABS securities data base of subprime loans.

**Figure 16**  
**Interest Rates**



SOURCE: LoanPerformance ABS securities data base of subprime loans.

lower credit scores and, to some small extent, on borrower down payments. For example, borrowers with the highest FICO scores tend to receive a lower interest rate. In 2004, average interest rates vary by over 2 percentage points from the highest to the lowest FICO scores.

This range of interest rates does not hold when pricing is based solely on down payments. In fact, the striking result from Figure 18 is that, on average, the pricing of subprime loans is very similar for all down-payment sizes, except for loans with LTVs greater than 100, which pay a substantial premium. One way to interpret these results is that lenders have found good mechanisms to compensate for the risks of smaller down payments and, as a result, down payments in themselves do not lead to higher borrower costs. However, if the equity in the home is negative, no sufficient compensating factor can typically be found to reduce expected losses to maintain pricing parity. The borrower has a financial incentive to default on the loan because the loan amount is larger than the value of the home. As a

result, the lender must increase the interest rate to decrease its loss if a default occurs.

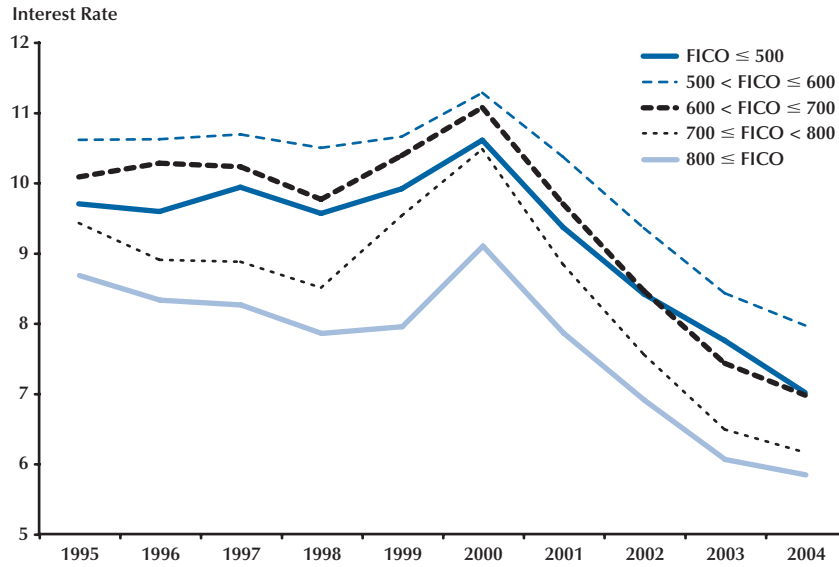
Figure 19 shows the average interest rate by loan grade. The riskiest borrowers (Grade D) receive the highest interest rate, whereas the least-risky borrowers (Grade A-) receive the lowest interest rate. Interestingly, although interest rates overall changed dramatically, the spread between the rates by grade have remained nearly constant after 1999. This may indicate that the risks, and hence the need for risk premiums, are in levels, not proportions, across risk grades.

**Prepayment Penalties**

It is beyond the scope of this paper to define specific examples of predatory lending, but prepayment penalties have been associated with predatory practices. A joint report by the U.S. Department of Housing and Urban Development (HUD) and the U.S. Department of Treasury (Treasury) (2002) defined predatory lending as lending that strips home equity and places borrowers at an increased risk of foreclosure. The

**Figure 17**

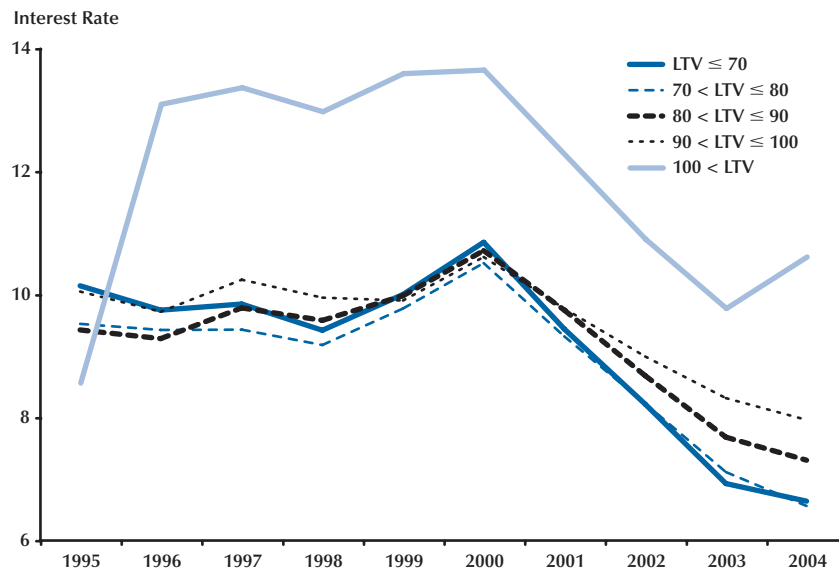
**Interest Rates by Credit Score**



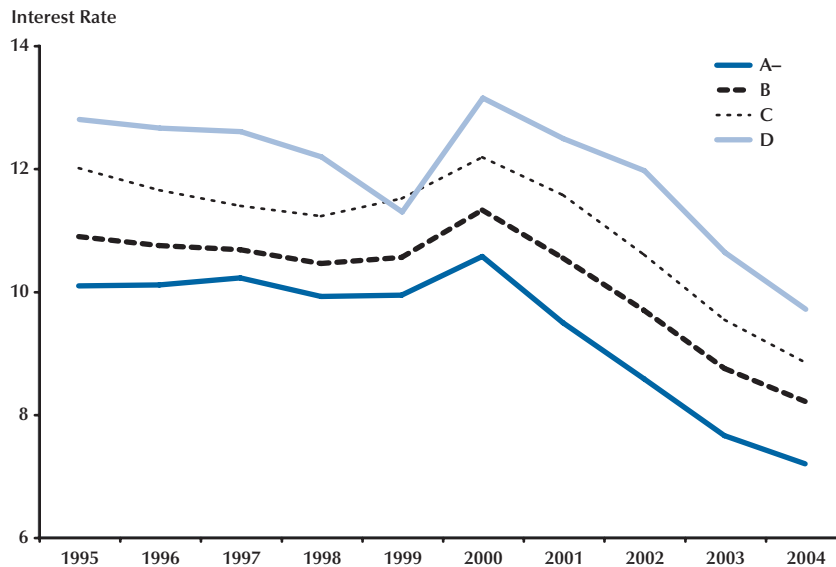
SOURCE: LoanPerformance ABS securities data base of subprime loans.

**Figure 18**

**Interest Rates by LTV**



SOURCE: LoanPerformance ABS securities data base of subprime loans.

**Figure 19****Interest Rates by Loan Grade**

SOURCE: LoanPerformance ABS securities data base of subprime loans.

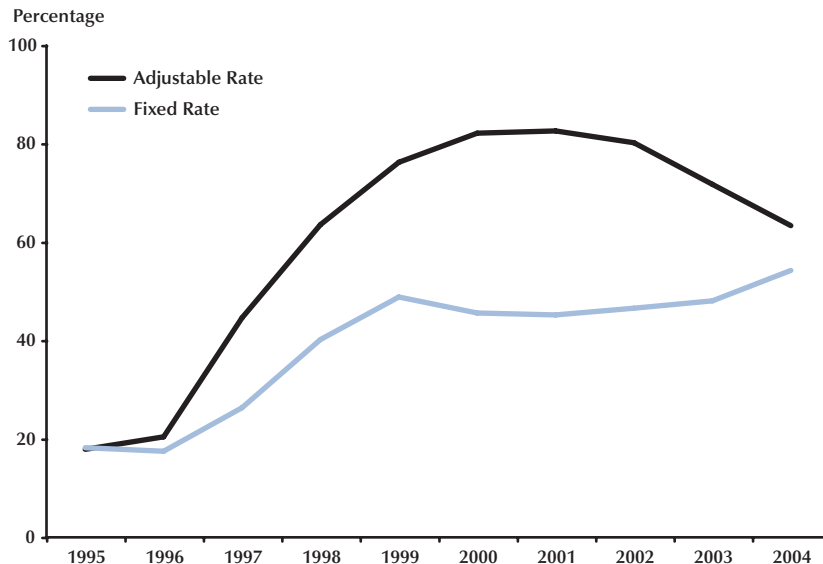
characteristics include excessive interest rates and fees, the use of single-premium credit life insurance, and prepayment penalties that provide no compensating benefit, such as a lower interest rate or reduced fees. In addition, some public interest groups such as the Center for Responsible Lending believe that prepayment penalties are in their very nature predatory because they reduce borrower access to lower rates (Goldstein and Son, 2003).

Both Fannie Mae and Freddie Mac changed their lending standards to prohibit loans (i.e., they will not purchase them) that include some types of prepayment penalties. On October 1, 2002, Freddie Mac no longer allowed the purchase of subprime loans with a prepayment penalty after three years. However, loans originated before that date would not be affected by the restriction (see [www.freddiemac.com/singlefamily/ppmqanda.html](http://www.freddiemac.com/singlefamily/ppmqanda.html) downloaded on 2/14/05). If a subprime loan stipulates a prepayment penalty, Fannie Mae will consider the loan for purchase only if (i) the borrower receives a reduced interest

rate or reduced fees, (ii) the borrower is provided an alternative mortgage choice, (iii) the nature of the penalty is disclosed to the borrower, and (iv) the penalty cannot be charged if the borrower defaults on the loan and the note is accelerated ([www.fanniemae.com/newsreleases/2000/0710.jhtml](http://www.fanniemae.com/newsreleases/2000/0710.jhtml)).<sup>11</sup> Therefore, we may expect to see a decline in the use of prepayment penalties starting in 2000 and 2002, at least in part due to changes in the demand for subprime securities.

Despite these concerns, prepayment penalties have become a very important part of the subprime market. When interest rates are declining or steady, subprime loans tend to be prepaid at elevated rates compared with prime loans (Pennington-Cross, 2003, and UBS Warburg, 2002). In addition, subprime loans tend to default at elevated rates. As a result, the expected life of an average subprime loan is much shorter than that

<sup>11</sup> When a borrower defaults, the lender typically will send an acceleration note informing the borrower that the mortgage contract has been violated and all of the remaining balance and fees on the loan are due immediately.

**Figure 20****Share of Loans with a Prepayment Penalty**

SOURCE: LoanPerformance ABS securities data base of subprime loans.

of a prime loan. Therefore, there are fewer good (nonterminated) loans to generate income for an investor to compensate for terminated (defaulted and prepayed) loans. One mechanism to reduce the break-even price on these fast-terminating loans is to use prepayment penalties (Fortowsky and LaCour-Little, 2002). Although this same mechanism is used in the prime market, it is not as prevalent.

Figure 20 shows that, prior to 2000, the use of prepayment penalties grew quickly. Substantially more ARMs than FRMs face a prepayment penalty. For loans originated in 2000-02, approximately 80 percent of ARMs were subject to a prepayment penalty compared with approximately 45 percent of FRMs. Equally important, the share of ARMs and FRMs subject to a prepayment penalty rose dramatically from 1995 to 2000. In fact, at the end of the five-year period, ARMs were five times more likely and FRMs twice as likely to have prepayment penalties.

This rapid increase can at least partially be attributable to regulatory changes in the interpre-

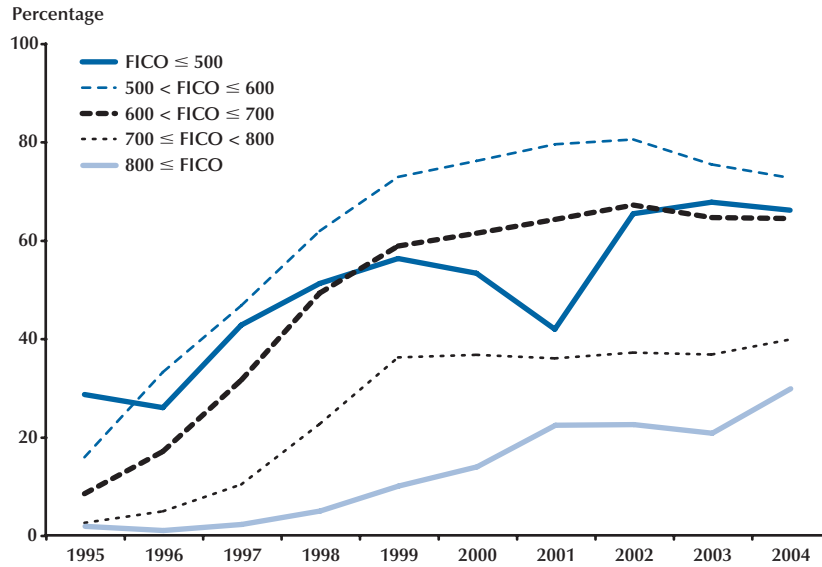
tation of the 1982 AMTPA by the Office of Thrift and Supervision (OTS). Before 1996, the OTS interpreted AMTPA as allowing states to restrict finance companies (which make many of the subprime loans) from using prepayment penalties, but the OTS exempted regulated federal depository institutions from these restrictions. In 1996, the OTS also allowed finance companies the same exemption. However, this position was short lived and the OTS returned to its prior interpretation in 2002.

In 2003 and 2004, prepayment penalties declined for ARMs and held steady for FRMs. This was likely caused by (i) the introduction of predatory lending laws in many states and cities (typically these include ceilings on interest rates and upfront fees, restrictions on prepayment penalties, and other factors)<sup>12</sup>; (ii) the evolving position of Fannie Mae and Freddie Mac on pre-

<sup>12</sup> For more details on predatory lending laws that are both pending and in force, the MBAA has a "Predatory Lending Law Resource Center" available at [www.mbaa.org/resources/predlend/](http://www.mbaa.org/resources/predlend/) and the Law Offices of Herman Thordsen also provide detailed summaries of predatory laws at [www.lendinglaw.com/predlendlaw.htm](http://www.lendinglaw.com/predlendlaw.htm).

**Figure 21**

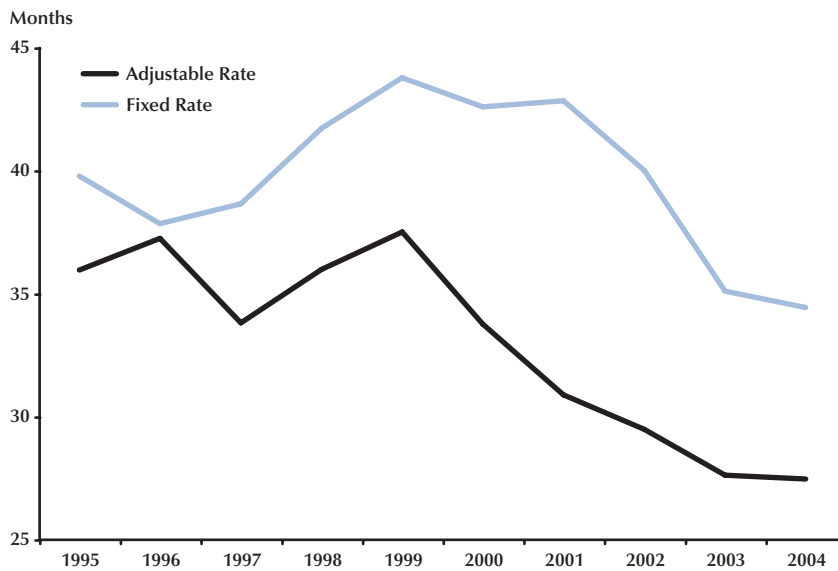
**Share of Loans with a Prepayment Penalty by Credit Score**



SOURCE: LoanPerformance ABS securities data base of subprime loans.

**Figure 22**

**Length of Prepayment Penalty**



SOURCE: LoanPerformance ABS securities data base of subprime loans.



payment penalties; and (iii) the reversed OTS interpretation of AMTPA in 2002 (see 67 Federal Register 60542, September 26, 2002), which again made state laws apply to finance companies just as they had prior to 1996.

The share of loans containing a prepayment penalty is lowest among borrowers with the highest, or best, FICO scores (see Figure 21). In 2003, for instance, about 20 percent of borrowers with a FICO score above 800 were subject to a prepayment penalty, whereas over 60 percent of borrowers with a FICO score below 700 faced such a penalty.

To understand the prevalence of these penalties, one must know how long prepayment penalties last. Figure 22 shows that the length of the penalty has generally been declining since 2000. Again, the introduction and threat of predatory lending laws and Freddie Mac purchase requirements (that the term of a prepayment penalty be no more than three years) is likely playing a role in this trend. In addition, FRMs tend to have much longer prepayment penalties. For example, in 2003, the average penalty lasted for almost three years for FRMs and a little over two years for ARMs, both of which meet current Freddie Mac guidelines.

## CONCLUSION

As the subprime market has evolved over the past decade, it has experienced two distinct periods. The first period, from the mid-1990s through 1998-99, is characterized by rapid growth, with much of the growth in the most-risky segments of the market (B and lower grades). In the second period, 2000 through 2004, volume again grew rapidly as the market became increasingly dominated by the least-risky loan classification (A-grade loans). In particular, the subprime market has shifted its focus since 2000 by providing loans to borrowers with higher credit scores, allowing larger loan amounts, and lowering the down payments for FRMs. Furthermore, the subprime market had reduced its risk exposure by limiting the loan amount of higher-risk loans and imposing prepayment penalties on the majority of ARMs and low credit-score loans. The use of

prepayment penalties has declined in the past few years because the securities market has adjusted to public concern about predatory lending and the regulation of finance companies has changed.

The evidence also shows that the subprime market has provided a substantial amount of risk-based pricing in the mortgage market by varying the interest rate of a loan based on the borrower's credit history and down payment. In general, we find that lenders of subprime loans typically require larger down payments to compensate for the higher risk of lower-grade loans. However, even with these compensating factors, borrowers with low credit scores still pay the largest premiums.

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